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CORWIN'S PATENT KNITTING MACHINE.

Improvement in Knitting Machines.

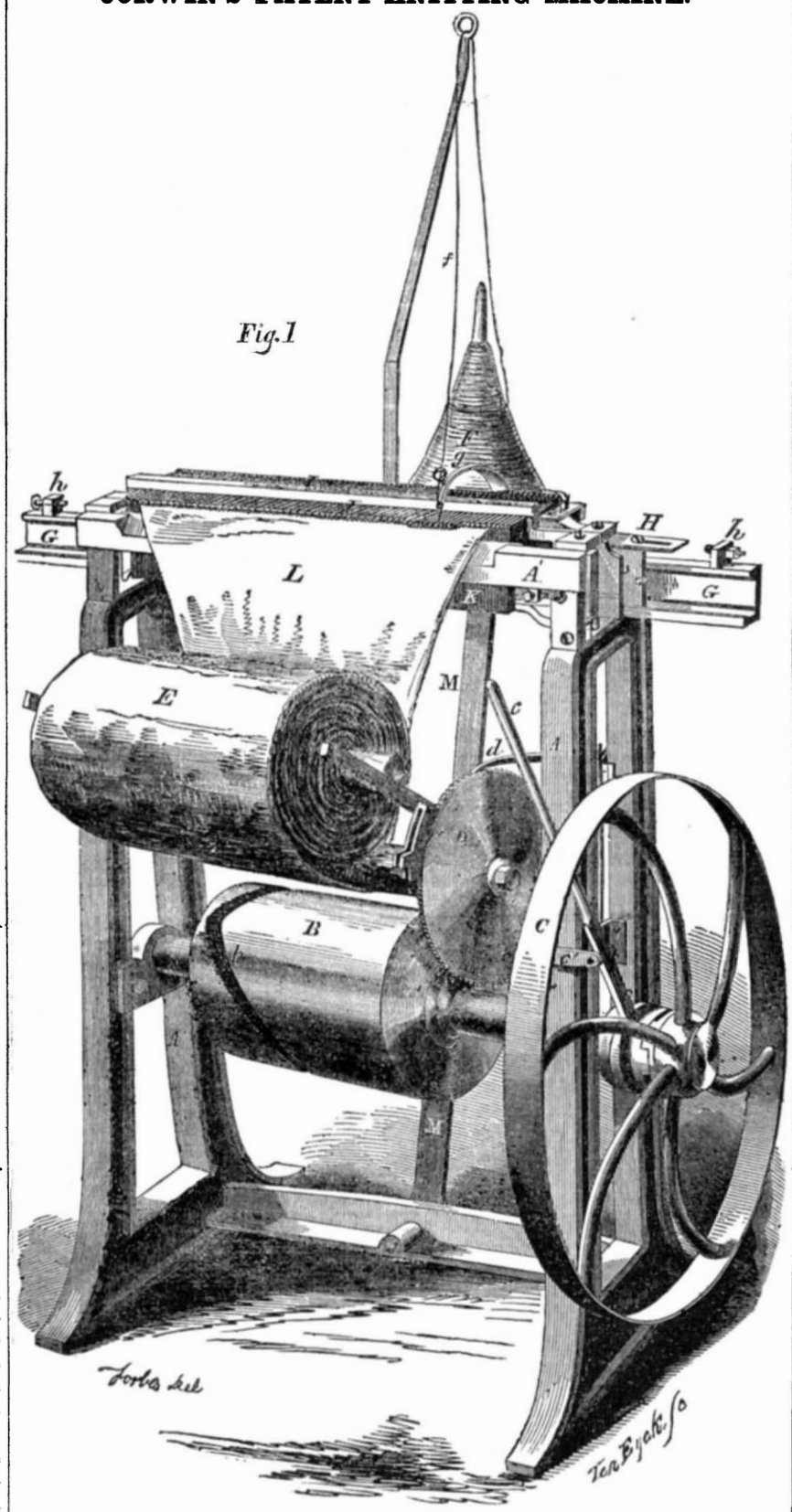
The accompanying engravings represent the improved knitting machine of Dr. Joseph A. Corwin, of Newark, N. J., for which a patent was granted on the 26th of Sept., 1354.

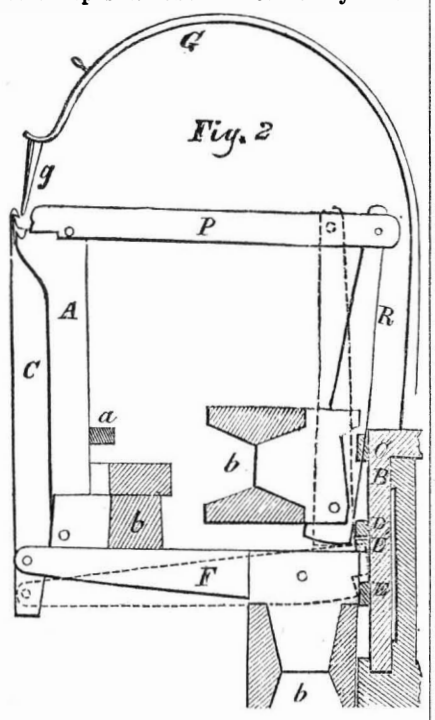
The peculiarity of the improvement in this machine consists in the method of forming the loops, by which the mechanism is greatly simplified. In the old knitting frames, the loops must all be formed for the course before those last laid can be cast off, a series of motions having to be gone through at the end of each traverse of the yarn guide before any new yarn can be laid on, hence considerable ime is thus lost. In this machine the loops are formed and cast off, and the course completed as fast as the yarn is laid on; hence the yarn guide is ready to return the moment it gets clear of the last sinker, thus saving considerable time; the loops, however, can also be formed for the course before being cast off, as in the old machines. This knitting machine consists of a series of devices or tools arranged in a row upon a frame, each set being a complete knitting machine of itself, and capable alone of forming a perfect loop.

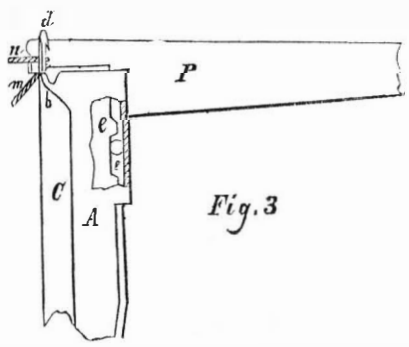
A A, fig. 1—a perspective view—represent the standards of the frame. B is a cylinder with a cam groove in it. C is the driving pul ley which gives rotary motion to B. M is a vibrating arm, and moves the yarn guide and the cam slide to operate the loop-forming devices. It has a stud passing into the groove, *b*; as the cam cylinder, B, is rotated, the arm, M, receives a vibrating motion from one side to the other at the back of the frame. Two bars project out in front to support the web of knitted cloth, E, and the roller shaft which moves it. D is a ratchet wheel with teeth, *d'*. The axis of this wheel is moved round with an intermittent rotary motion, and forms the take-up. The knit cloth, L, passes around E, under the axis of the wheel, D. *d* is a ratchet on a vibrating arm behind, and there are two small cams on the main shaft, which strike the foot of the bar of the ratchet, making it take stroke after stroke in different teeth, *d'*, to push around wheel D, exactly the distance of a set of loops, as formed, so as to have a positive and correct take-up of the web or beam, E.—*c* is a clutch to throw the machine in and out of gear at pleasure. A' is a metal box in front of the machine, and G is another on the back part of it. This latter is a raceway for the cam slide which operates the needles and sinkers to form the loops (these are shown in fig. 2.) H is the slide, operated by the cam arm, M; and *h h* are set screws at the ends or the box, G, to regulate the traverse of the slide, H, against which it strikes at the end of each stroke to shift the traverse of the yarn for a return set of loops. F is the spool containing the yarn. *g* is the traveler or guide which feeds the yarn, *f*, to the needles. I is a small strip or bar screwed down on the top of the sinkers, J, to keep them in place. Fig. 2 is an enlarged view of sinkers and needles, and the way they are operated, taken across through the boxes, A' K and G, on the top of the frame, fig. 1. G represents the curved arm which carries the yarn, *f*, of fig. 1, and *g* is the yarn traveler which feeds it to the needles and sinkers. P is a sinker, and R its leg or jack. It is pivoted below, a short distance above its foot, so that by pressing below its pivot it will be thrown backward at the top, as shown, and by pressing above its foot pivot, it will be thrown forward, as shown by the dotted lines. A series of these sinkers, thus made and pivoted, are placed in a row in a frame, and operated one after the other by two cams, C D, on the slide, B, the one cam to push forward the head of each sinker while moving rapidly along, and the other to thrust it back in the same manner. The slide, B, has four cams on it. It is moved back and forth by the arm, M; two of its cams, E E', are for operating the needles, C, and the other two for the sinkers, P. The one cam, E', by pressing upon the top edge of the treddle lever, F, of needle C, will throw up the needle; and the lower one, E, by throwing up the back end of F, will vibrate the needle, C, down. These cams are placed on slide B—the one before the other—so as to give an intermittent reciprocating motion to the needles and sinkers, one after the other along the whole series, to make them work into one another with a thrust up and down of the needles, C, and a thrust back and forth of sinkers P. *b* are different comb bars to which the needles and sinkers are secured by their pivots which are a long wire axis; each pair is separated by a small plate.

A is a peculiar hook sheath, which performs an important office. It has a small india rubber spring, *a*, placed behind it to keep it pressed forward, but it is set upon a pivot near its foot, to allow of a slight lateral vibratory motion. Its top is horn-shaped, as shown; it is also double, being formed of two very thin plates, and the needle, C, as it moves up and down, plays between them, as in a sheath. The needle, C, is barbed downwards, and sheath A, has its hook or horn upwards. From the base of each needle head there projects a small thin flange, which serves an important purpose in working these tools or devices. It is by the combined operation of the hook on A, and the barb on the needle, C, that the loops are drawn through one another and thrown off. This is more fully delineated in fig. 3, which is a side section of a sinker, needle, and sheath.

The needle plate, C, works in sheath A, and is enlarged upwards, and has a prong, *e*, (seen through the broken part of the sheath,) which answers the purpose of a small cam that acts on a pin in the sheath. A lateral motion takes place during the up-and-down motions of the needle plate, caused by the small cam acting on the small pin at *e'*. We will now describe how a loop is formed and thrown off by a single set of devices, as represented in fig. 3. *m* represents a loop of a previous course, and *n* that of the last course—the yarn being shown in section. P is the sinker, around the end of which the new loop is still held. The plate of needle C is now depressed by cam, E, and as it goes down the loop, *m*, comes in contact with the hook, *b*, of the sheath, A, upon which it is taken. The object of the small flange below the barb, *d*, of the needle is now seen, forming an angle of the yarn, and leaving room for the hook to get past. When the lower loop, *m*, is fairly on the hook, *b* (which is double,) the cam or inclined projection, *e*, on C, strikes pin, *e'*, which unites the two sides of A together, and it thus forces the sheath backward at its upper end, when at the same movement the barb, *d*, of the needle takes hold of loop *n* and secures it. The loop, *m*, by this movement has been carried away from under the loop, *n*, and is now carried clear past the barb, *d*, in order that it may be discharged. As the plate, C, of the needle continues to descend, the barb, *d* draws down the loop, *n*, and makes it slip from sinker P. The hooks on the sheath, A, are now in position over the top of the barb of the needle, and the plate, C, has been dropped in place, so that the top of the needle is di-







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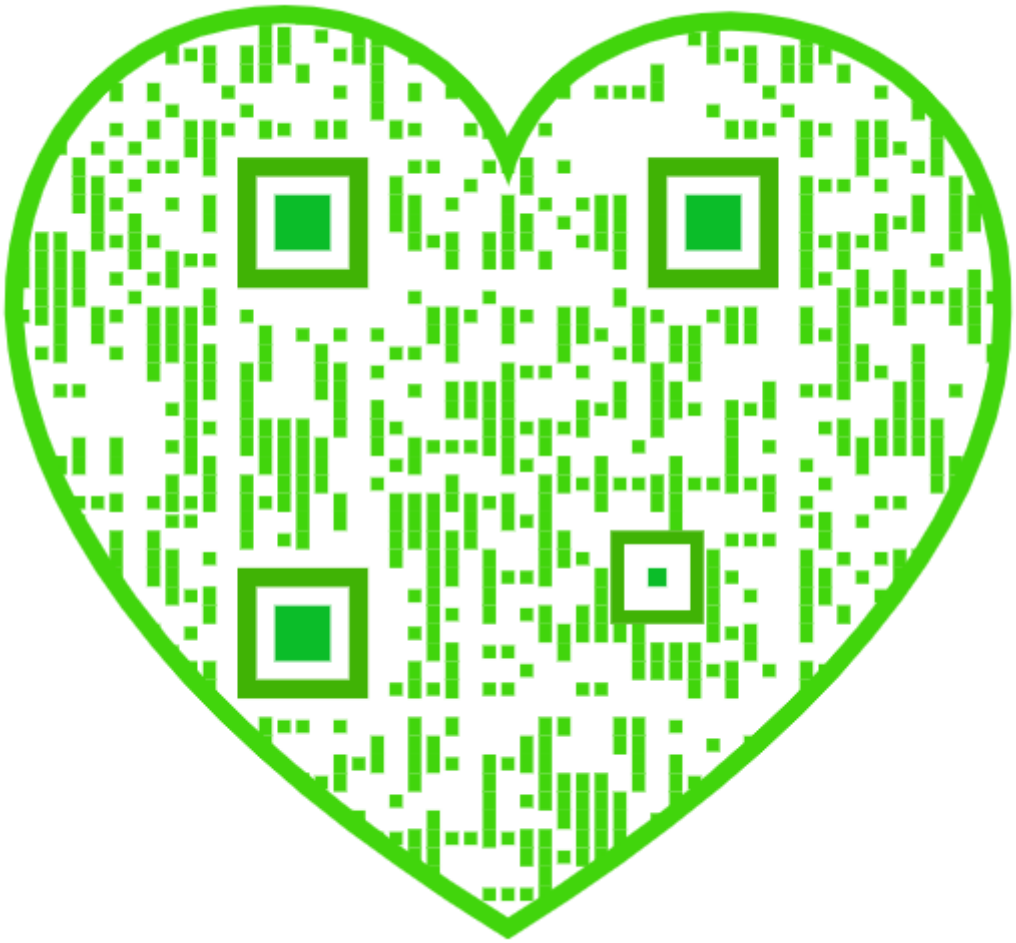
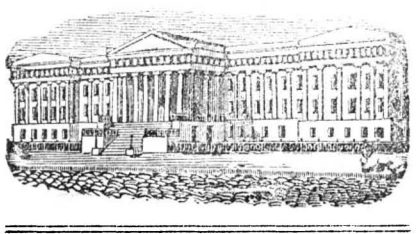


rectly under the hooks of the sheath and between them. The plate, C, of the needle is then made to ascend by cam E', pressing on the top of lever F, and when the horn of the needles comes under loop *m*, on the hook, *b*, it strips or discharges said loop, and a stitch is thus completed. The loop, *n*, now lies around the shank of the horn of the needle, in the place formerly occupied by *m*, and the yarn is laid above by the guide, *g*, for a new course. The process thus continued for a length of time, makes a web of any desired width, like L, according to the number of needles, sheaths, and sinkers employed. The sinkers, it will be observed by fig. 3, force the yarn against the face of the needle to be caught by its barb, which act accomplished, they are forced back by the cam, D. These operations of the series of tools or devices in this frame are carried on with great rapidity, weaving or knitting like the common cloth power loom, leaving a selvedge on both sides the knit web.

On starting the machine, it is presumed that there is a course of loops on the horns of the needles. Motion is now given to the shaft of the cam cylinder, B, fig. 1, when the slide, B, fig. 2, is made to advance in the box, G, by rod M, and the yarn guide, *g*, is made to travel below barb *d*, behind its horn. The traversing cam, *c*, on slide B, now pushes forward the sinkers, P; these thrust forward or sink the yarn into loops around the horns of the barks, and when a sinker is thrust on each side of a needle, the latter may be depressed by the cam, E, operating treddle, F, when the needle is forced down, drawing the loop last made through the one of the previous course (*m* fig. 3,) which is caught on the hook, *b*, and carried back from the needle horn by the lateral motion of A, as has been described. The formation of each loop is thus a distinct operation, going on as fast as the yarn is laid on by the traveler, *g*. In the old machines, a whole row of loops are first made, the sinkers then raised, and the cast-off effected. The same principle of operation embraced in this machine may be effected on a circular frame to weave a circular web. This knitting loom is very certain in its action, as each loop is formed and thrust off with such accuracy that no loops are let down, and all knots or unevenness of yarn are carried to the wrong side of the web, thus leaving a beautiful face on the fabric. All the parts are made strong, and can be operated with great rapidity. We have seen the loom represented in operation, and had occasion to admire its simplicity, originality, and the excellent fabric made by it. It will be seen in operation in the Crystal Palace, at the Fair of the American Institute, and more information may be obtained respecting it by letter addressed to Dr. Corwin, at Newark, N. J.



[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING SEPT. 25, 1855.

APPARATUS FOR DISCHARGING RESERVOIRS, &c.—Daniel Bedford, of New York City: I lay no claim to a float for either opening or closing a valve, nor do I claim a balance valve when the levers and weights thereof are not so arranged as to hold the valve open when opened by the weight of water, &c., these being old and well-known devices, and form no part of my invention, which is the tumbling lever valve, and combined therewith the float.

Therefore I claim the mode of hanging and balancing the valve, c, by means of the lever, e, and its appurtenances, in the manner, and for the purposes set forth.

I also claim, in combination therewith, the float, g, for closing the valve, c, when the whole contents of the receptacle are discharged.

MACHINES FOR SAWING STONE.—C. G. Bietel & H. J. Brunner, of Nazareth, Pa.: We do not claim flexible saws, radial and curved ways, or guiding rollers separately.

But we claim the combination of the flexible saws, D D, rollers, E E, adjustable radial ways, G G, and concentric grooves or ways, M M, whereby the saws are enabled to run at different angles, and their open ends to approach and separate without affecting the degree of their tension, substantially as described.

FIRE ARMS.—Fredk. Beerstecher, of Philadelphia, Pa.: I do not claim the general arrangement whereby two loads may be discharged, in succession, from one barrel without reloading, as such arrangement is not new.

But I claim constructing the head of the hammer of fire arms of this description so that the part of the head which discharges the forward load can be capable of being turned down for the purpose of allowing the shorter part of the head to strike the rear tube only, and so that when turned up it shall strike the forward tube only, without the use of the intermediate covering lever, heretofore required, for the purpose of preventing the explosion of the rear cap, in fire arms of this description, the same being constructed arranged, and operating substantially as described and set forth,

PRESSURE STOPPERS FOR CHAIN CABLES.—James Emerson, of Worcester, Mass.: I claim the arrangement of the jaw hinged at its one end, and having a pawl at or near the other, with the bed plate for operation together, and the whole being constructed substantially as specified.

[This improvement consists in a means of preventing the injurious effects resulting from the sudden jerking of the anchor chain, when a vessel is riding at her moorings. In rough weather and a heavy sea, the windlass is liable to be injured, and the chain to be snapped, from the cause above-mentioned. Mr. Emerson makes use of a stopper, one portion thereof consisting of a sliding weight under which the chain passes. The weight is pressed down upon the chain by means of a lever, so that the degree of pressure may be very easily regulated. When the force of the jerk exceeds the pressure of the stopper, the chain will slip a little, and so afford the required relief. This is a very cheap, simple, and effective invention. Our nautical friends, we feel confident, will be much pleased with its operation. T. B. Mackay, Esq., of Boston, Mass., is one of the owners of this patent.]

RAKES FOR REAPING MACHINES.—Thos. N. Lupton, of Winchester, Va.: Being well aware that cranks, Pitman rods, and gear devices have been employed as elements, in part, of the mechanical construction of grain harvesting machines. I do not claim such devices separately.

But I claim the construction of an automatic rake, having a revolving tubular or sleeve socket, L, with a revolving extension or reciprocating piston rod, m, a slide socket, q q, with a sliding arm, r r, and a geared rake device, w w, in combination with the collar, f f, the whole being constructed and operated substantially as described.

WRENCH.—Henry J. Behrens, of New York City: I claim the employment of an eccentric, toothed on its periphery, and held down by a spring, as described, in combination with the smooth bar wrench, in the manner and for the purpose herein set forth.

ACTUATING GAS ENGINES.—Wm. Mt. Storm, of New York City: I claim operating an engine by the agency of water charged with a gas permanently uniform at ordinary atmospheric temperatures and pressures, and over which water has a self-acting power of absorption when the process consists in passing a given quantity of the gas set free in charges, under pressure, by heat, through the engine, actuating its piston, and thence to a closed, cool and wet vessel, while cotemporaneously therewith I cause to pass to said vessel a sufficient quantity of the same water which had just previously held the gas absorbed to re-absorb it—both water and gas being cooled, meanwhile, by means specially provided, to an extent sufficient to cause their re-combination in the original form of gas-charged water—by all of which means the motive power of the gas is obtained, without the necessity of converting the water into steam; while, at the same time, the gas is thereby re-concentrated and preserved for re-use, without entailing an accumulation of water in the heating or separating vessel, or an accumulating pressure of free gas in the cold receiver, all as set forth.

SHIP'S RUDDERS—J.S. Robbins, of San Francisco, Cal. I claim arranging the two rudder, and combining them by means of the arms, b b, and b' b', and connecting rods, c c, substantially as, and for the purpose herein set forth.

[In this improvement two rudders are employed to steer the vessel. One of them is attached to the stern post in the usual manner; the other placed directly behind the first, and secured in an iron frame which projects back for that purpose. The two are connected together with arms in such a manner that the force of the water, when it comes in contact with the after rudder, will assist the helmsman in moving the post rudder, so that they counterbalance each other. This, it is said, reduces the labor of steering to almost nothing, gives complete steadiness to the wheel, and enables a single man, or even a boy, to guide the largest vessel in the fiercest storm, with perfect ease. The inventor is confident that in this improvement the objections which have hitherto attended the use of double rudders are entirely overcome, while the important advantages above named are secured, together with many others not here enumerated. We commend this patent to the attention of all who are interested in marine affairs.]

OPTICAL INSTRUMENTS.—Robt. B. Tolles, of Canastota, N. Y.: I claim constructing the eye-piece as described, in such a manner, that when placed at a proper distance within the focus of an object glass, its anterior refraction shall be properly that of a concave lens, substantially as set forth.

HOLD-BACK FOR CARRIAGES—Alonzo Webster, of Montpelier, Vt.: I claim the dovetail groove, D, the dovetail slide, E, and the spring, G, the whole being applied and made to operate substantially in the manner and for the purpose specified.

LEATHER FINISHING MACHINES—Chas., T. F., and J. W. Weston, of Salem, Mass.: We claim, in a machine for finishing leather, in combination with the soft elastic bed, and elastic finishing tool, the cord, p, secured to the tool stock, for the purpose of keeping the tool clear of the leather, during its retrograde movement over the bed, as set forth.

BORING MACHINE—A. Wyckoff and E. R. Morrison, of Elmira, N. Y.: We claim, first, the employment or use of the tubular or hollow auger, constructed as shown, for the purpose specified.

Second, we also claim the combination of the tubular or hollow auger, D, and worm or screw, J, arranged substantially as shown and for the purpose specified.

[Messrs. Wyckoff & Morrison have produced a very novel improvement. It consists of an auger, made, externally, in the form of a tube. The cutters are placed just within the periphery of the tube, at its lower end, so that when the latter is revolved a hole is bored and the auger enters the stuff, while the chips rise through its hollow interior. The outside of the tube is furnished with a spiral ledge or screw, which assists the rise and discharge of the chips. It is said that nothing can exceed the facility and accuracy with which pump logs are bored, and other species of work accomplished by the use of this improvement. Every mechanic will be struck with its simplicity and cheapness.]

COFFEE POTS.—Joshua E. Hall, of Cleveland, O.: I claim the conical tube, E, with the knob, F, and aperture, H, which serve as its continuation. This I claim, in combination with the reservoir, D D, as set forth.

MAKING PRINTERS' TYPES—S. S. Weed, of Stoneham, Mass.: I claim, for making type, the described combination and arrangement of the stationary body or bed die, I, a bottoming die, M, and receiving orifice, N.

I also claim the combination of the feeding lever, R, the nipper, S, and the rod, T, provided with shoulders, U V, as set forth, the whole being for the purpose of feeding the type rod into the mechanism, or its dies, as specified.

TRIP HAMMERS—P. L. Weimer, of Reading, Pa.: I claim the arrangement of the hub, or center piece, B, the pawls, F, the interior ratchet ring, D, the lined metallic strap, S, the hand wheel, E, and the post, P, the whole being combined, arranged, and operated in the manner, substantially as specified.

[This invention consists in the peculiar mode of operating the cut-off valve, whereby the steam may be let into the cylinder and cut off at varying points for the purpose of regulating the force of the blow of the hammer. We should need diagrams to illustrate its operation. The movements of the hammer may be instantaneously controlled, at the will of the operator. We regard it as one of the best improvements of its class.]

BEDSTEADS—Wm. White, of Portsmouth, Va.: I claim the jointed parallelogram of bars, provided with rods, or their equivalents, which extend to the bedstead at several points, and are secured thereto and tightened, substantially in the manner and for the purposes set forth.

FLOURING MILLS—D. S. Wagener, of Penn Yan, N.Y.: I claim the arrangement of tubes, B and C, connected by the suppiemental shoe, K, within the air-tight chamber, A, in the manner described and for the purpose specified.

ARTIFICIAL LEGS—John Taggart, of Roxbury, Mass., assignor to himself and T. D. Parker, of Boston, Mass.: I claim making the leg and foot without any ankle joint, as specified.

I also claim combining together and with the foot, the part A, and the thigh case, B, the two springs, C and L, so as to operate therewith, substantially and for the purpose as specified.

SHIPS' WINDLASSES—J. B. Holmes, assignor to J. R. Pratt and J. B. Holmes, of New York City: I make no claim to the application of wheels, or gearing of any description, to ships' windlasses, for the purpose of occasionally increasing their power, as such has been done before; and in particular, has been described by Hendmarsh and others. Nor do I make any claim to the stationary or revolving shaft or spindle or spindles, of the chain barrels, A A'. Nor do I claim any of the parts constituting my windlass, when detached or separated.

But I claim the arrangement of the shaft, E, with its gearing wheels, F and G, and the clutch coupling, H, in relation to the drums of the windlass, and their gearing, as set forth, whereby the one or both drums may be moved with a quick or slow motion, or the one drum may be moved with the quick and the other with the slow motion, at the same time.

[We have in preparation some engravings illustrative of the above invention; they will be published as soon as the foreign patents, which are now being solicited through the Scientific American Patent Agency, are granted.]

REGULATING LENGTH OF STROKE IN MORTISING MACHINES.—Ezra Gould, of Newark, N. J. I claim attaching the connecting rod, O, to a curved slotted arm, E, by means of the plate, e, and pins, f i, the plate, e, working in a slot, c, in the pulley, A, and the arm, E, operated, by means of the gearing, l n p s, and q k, arranged as shown, or in an equivalent way, for the purpose specified.

[The above is a power mortising machine, and the improvement consists in a peculiar arrangement of parts, whereby the depth to which the chisel enters the stuff is made variable. At the first stroke the chisel enters but a short distance; at the next stroke it sinks deeper, and so on; the variation in the depth being accomplished without stoppage of the machine. Drawings would be required in order to describe the parts clearly. It is sufficient to say that the features above mentioned, to which are combined other new and convenient arrangements, render Mr. Gould's improvement, apparently, one of great value. The rapidity of its performance, and the excellence of the work it produces, will render it a very general favorite.]

CORRUGATED BEAMS.—Richard Montgomery, of New York City; I claim a supporting beam, formed of sheet metal of unequal thickness, bent into a series of folds substantially as represented and set forth.

AWNING FOR HORSE AND DRAY.—Jacob Nelson, of Cincinnati, O.: I claim the portable and reversible dray and horse canopy, whose poles, f, are hinged at one end to posts, h, and supported in either the forward or backward position by branches or brackets, g h, projecting from the posts.

[This is a good improvement. In all our cities it is customary to expose dray horses to the burning rays of the sun in summer, although, owing to the slow rate at which they travel, they might be protected by some such simple device as the above.]

MACHINE FOR CUTTING ORNAMENTAL MOLDINGS.—H. & Richard S. Schevenell, of Athens, Ga.: We do not claim the reciprocating gate or slide, F, with cutters attached, for they have been previously used.

But we claim the combination of the reciprocating gate, or slide, F, rotary patterns, L L, and the inclined planes or wedges, M M, the above parts being arranged substantially as shown, for the purpose specified.

[The above invention relates to improvements in machinery for the production of the various kinds of irregular figured ornamental moldings, that are now so extensively used in the finishing-up of railroad cars, furniture apartments, cabinet work, &c. The nature of the invention consists in combining a rotary pattern with the ordinary up-and-down cutter gate. One of Mr. Schevenell's machines, we are told, will last longer, do more work and of a better quality, than any machine of the kind now known. We regard it as an excellent improvement.]

RE-ISSUE.

PUMPS—L. P. and Wm. F. Dodge, of Newbury, N. Y. Patented June 7, 1853. We claim the combination of the cylinder or chamber, A, and the piston, constructed as described, with its valves, and the induction and eduction passages, so that the water all entering said cylinder, under pressure, alternately at its ends, is discharged under pressure, through the opening at its side, producing a constant and direct stream through the piston heads from the cylinder, substantially in the manner and for the purpose set forth, thus dispensing with chambers and partitions in the barrel and valves, at the eduction port, preventing leakage, and rendering the pump, more simple and effective, and less liable to derangement.

Very Important Patent Case.

SICKLES' CUT OFF.—A very important decision has just been rendered by Judge Nelson, in the U. S. Circuit Court, this city, on a motion made for a preliminary injunction by W. B. Sickles and others, to restrain D. L. Young, S. Cutter, J. Barstow, and George H. Corliss from infringing the patent of F. E. Sickles, granted in May, 1842, for a method of operating the valves of steam engines by adjustable cams or trippers, and the preventing of the valves from slamming in their seats, by a dash pot containing fluid. The defence set up was non-infringement. The defendants were using the engine of Corliss and Nightingale, of Providence, R. I., for which G. H. Corliss had obtained two patents (in 1849 and 1851,) embracing an entirely different mode of operating the valves, and also preventing their slamming, by the use of a cylinder as a cushion. A motion was made for the same kind of injunction in the early part of last year, but the Court then ordered the points asserted to be infringed by complainant, and not to be infringed by the defendants, to be tried at common law by a jury. This was done in December, 1854, before Judge Betts, this city, when the jury decided that the defendants did infringe the plaintiff's patent, as published on pages 157 and 158, vol. 10, SCI. AM. The decision now rendered by Judge Nelson is just the same as might have been made on the first motion for a preliminary injunction, as it is given simply on a renewal of that motion, and it denies and sets aside the verdict of the jury. It amounts to this, that the patents of Corliss are essentially different from Sickles', and that his engines do not infringe the "Sickles Patent." We are of the opinion that the decision is a correct one, but the Judge ought to have rendered it on the first application, and thus saved the expense of the jury trial, which occupied three weeks. It appears to us that both Court and counsel have done complainants and defendants wrong, by thus leading them into such enormous expenses.

Resistances on Wide and Narrow Curves of Railroads.

The *Tribune* of the 23d ult. contained an article on some experiments lately instituted to test the power of locomotives on the New York and Erie Railroad, says:

"The width between the rails on this road is six feet, that of a great majority of the roads being only 4 feet 8 1-2 inches; and many contend that the resistance to motion on curves is increased with each increase of width, an opinion which, although apparently well founded in theory, this experiment has done little to establish. Although frequent experiments of this kind have been tried at various times on long lines of narrow roads, this is the first to our knowledge of a 6 feet gauge."

Experiments of this kind can just as well be tested on a short as on a long line, if the conditions are the same. Clark says, on page 301: "A curved line has been estimated to have added 10 to 12 per cent. to the resistance in the case of the Bunscombe Incline on the broad gauge, (7 feet), the curvature being undetermined. On the narrow gauge, (Caledonian, 4 feet 8 1-2 inches,) it was estimated that curved line, having one curve under 1 mile radius for every 2 1-2 miles, incurred an excess of resistance equal to 20 per cent. of that due to a line practically straight."

The length of axle on a wide gauge is a great disadvantage on sharp curves, in comparison with the shorter axle on narrow cars; this is the only increase of resistance that can be experienced. But the *Tribune* is right with regard to experimental data, in reference to what that amount comparatively is, on narrow and broad gauges of the same curve. Loose wheels have been proposed and tried, to reduce the resistance on curves, but hitherto, so far as we have been able to learn, without success.

Railroad Verdict.

An accident took place last week at West Albany, (near old Albany,) on the New York Central Railroad, by which the engineer, John Pratt, and the fireman, F. E. Kirkland, were killed. When a freight train was crossing the switch at the above-named place it parted its connections, and five cars were left on the track, and at this time up came the passenger train at the rate of thirty miles an hour and run into the five freight cars on the track. The verdict of the jury called at Albany on the 21st ult. is, "that the accident was caused by the engineer violating the rules of the Superintendent by running about twenty-four miles faster than his instructions allowed, which are that at that place the speed of the trains should not be above six miles per hour."

Improvements in Railroads.—Atmospheric Resistance.

The editor of the Glasgow *Practical Mechanics Journal*, in the number for this month, reviews the work of D. K. Clark, on Railway Engineering, says that his deductions on the resistance of engines and trains "appear to be thoroughly and well worked out, and tabulated with the skill of a master." This is the author we quoted as sustaining our views respecting other resistances than that of the atmosphere increasing according to the square with the velocity. Our views are sustained by the best and most scientific judges of the question. Our railroad companies should not forget that this practical and scientific author has said, "The great element for improvement is the *permanent way*."

Hydro-Sulphuric Acid.—Erratum.

In the last number SCI. AM., page 8, column 4, for the word "hydro-sulphuric acid" read "dilute sulphuric acid." Philologically the word is correct. Its simple meaning is "water and sulphuric acid," but in chemistry hydro-sulphuric acid is understood to mean sulphuretted hydrogen—hydrothionic acid, S H.

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Mutual Loan Association for Inventors.

MESSRS. EDITORS—I would call your attention to the subject of forming a Mutual Loan Fund Association, for the benefit of the poor inventors who make valuable improvements or inventions, and new and useful machines, but have not the means of securing the same and bringing them before the public, so that the inventor himself may reap his just reward for his arduous toil. I am well aware that this is not often the case, as the poor hard-working mechanics are, in a great many instances, the inventors of the very best machines or improvements we have in use, who receive little or no benefit from their inventions. But it is the speculators who buy their inventions for a small sum and realize a fortune in a short time. This should not be so; something should be done for the benefit of this class of inventors. I will leave the subject at present, hoping to hear something from your able correspondents on the same through the columns of your valuable paper. S. W.

Woburn, Mass.

[The writer of the above, in an additional note, states that he is the inventor of a valuable improvement, and intimates that if such an association as the above existed he would be a candidate for its consideration; that he has a family to support, and his means are too small to enable him properly to patent his invention, &c.

In our opinion, the time has gone by when "poor inventors" are *obliged* to sell their inventions for a song to speculators who realize millions therefrom. There are some inventors, we admit, who are fools enough to do this, but they lack common sense. They are just as likely to throw away a treasure in money, or to kill the golden-egged goose, if in their possession, as to relinquish for nothing their title to a valuable invention.

Some inventors keep their secrets locked up fast within their own breasts, and then grumble because they have not at command all the money they want. They seem to think that Providence has dealt unfairly in not creating them millionaires as well as geniuses.

Other inventors are very indolent, and live from one year's end to another without making any effort to let people know what they have done, or without *trying* to find aid.

Then there is a class of perpetual-motionists, and people who re-invent old and worthless contrivances; always insisting, however, that they have discovered the veritable philosophers' stone. Such persons, if they fail to draw others into their foolish schemes, become eloquent on the grievances of "poor inventors." Well they may, their inventions are "poor" as well as their purses.

So far as our observation goes, inventors have little cause for complaint on account of scarcity of material aid. No such scarcity exists. On the contrary, there is a great and growing demand for *good* inventions of all kinds; if proper steps are taken, there is generally no difficulty in obtaining abundant assistance to develope them. But to find aid, inventors must cast about a little, and if necessary make active exertions. They ought not to expect that men of means will take a greater interest in the success of an invention than they do themselves.

We should be glad to see a Loan Association established, as proposed by our correspondent, if it could succeed or do any good. But we fear that such a concern would be obliged to discriminate more closely than do capitalists, and never touch an invention unless its excellence was established beyond peradventure. "Poor inventors" would therefore still continue to suffer quite as much as they do at present.

Safe Method of Preparing Laughing Gas.

Noticing in a number of the last volume of the SCIENTIFIC AMERICAN some in tructions in regard to the preparation of Laughing Gas. and fearing injurious results might, under some circumstances, be anticipated from an attempt by the novice, I would present the following, as successfully and safely adopted by myself several years since.

Prepare a flask by fitting to it a glass tube suitably bent. Into this flask put two or three ounces of nitrate ammonia. For a gas holder, fit to a large stone jug a cork pierced with two apertures by a burning iron. Into one of the apertures put a tube of glass or tin so that it shall come within half an inch of the bottom of the jug when the cork is put in its place, and let the other orifice be stopped with another cork. For a pneumatic tub take a common wash tub and fit to it a strip of board passing through the middle, and about eight inches from the top, so that when the tub is filled with water the board will be covered. The board must have a hole through it, over which the mouth of the jug is to be set. Having prepared things as before directed, fill the jug with water and invert it over the aperture of the board, bend the tube belonging to the flask so that it will just enter the mouth of the jug, and setting the flask on the lamp stand apply a very gentle heat. The salt will soon melt and gas be extricated in abundance.

When the jug is nearly full—which can be told by the noise of the bubbles—slip the hand under its mouth and set it upright, then immediately put the cork with the tube through it in its place. Having prepared the gas, let it stand over the water that remains in the jug for an hour or two, shaking it occasionally, so that if it should contain any nitrous gas it may be absorbed.

To respire the gas prepare a bladder or oiled silk bag by attaching to it a tube which exactly fits the second aperture in the cork, and having squeezed all the air out of the bladder or bag pass in the tube. Next pour such a quantity of water into the jug through the long tube as you wish to obtain of the gas. The gas cannot escape through the long tube because its lower end is immersed in the water—it is therefore forced into the bladder or bag. When this is full withdraw the tube from the jug, and holding the nose with one hand, with the other apply the tube to the lips and respire it backwards and forwards from the bladder to the lungs. The lungs must be first exhausted of air by breathing out before the gas is inspired. The quantity breathed is from two to four or even eight quarts. H.

Hartford, Conn.

Double and Single Steam Engines.

MESSRS. EDITORS—I am running machinery from a line of shafting sixty feet in length, driven by a single cylinder; the shafting has six couplings, and I find them much worn and loosened after one season's running—an effect I attribute to the unsteady motion of the engine while passing the "dead points." A pair of burrs are also driven by the same engine, and a similar effect is produced, as a set of cogs in the sub wheel have been worn out in three months, which I think would not be the case were the power furnished by a water wheel, or two steam cylinders.

If the reason assigned be the true one, the evils can be overcome partially, by using very heavy fly wheels, and much quicker motion of the engine; but the true remedy, in my estimation, is two cylinders working on one crank shaft. VHERON LEE.

Central College, Franklin Co., O., Sept. 13, 1855.

Reaping and Mowing Machines—Controverted Point.

MESSRS. EDITORS—I observed by proxy, in the SCIENTIFIC AMERICAN of July 7th, 1855, page 341, a dispute about the original inventor of the reel and the raker's seat for grain reapers, as patented by McCormick in 1837. Now I do not like controversy, but even at this late date I am prepared to prove that in my experiments on grain reaping in A. D. 1824, '25, and 26, I used the reel as it is now used by McCormick and others, that I used the crank to propel the knives, and fingers to gather and hold the grain while it was cut. Improvements, truly, have been made on my original fingers for gathering the grain, but decided misimprovement has been almost universally adopted in the diminutive wheels on which reaping machines ride; the small size of the wheels often causes them to mire down in wet ground, and they always draw much harder in the grain field. No other thing about grain fields is so unphilosophical. In 1826 I used the large wheel of a common lumber wagon to run next the standing grain, as well also as the other wheel to propel the knives to cut the grain; and if that sized wheels had been in use universally, it would have saved the farmers hundreds of thousands of dollars. Does any neighbor editor still ask why I did not secure my invention by a patent? I again reply, that good judges then considered the patent laws only well calculated to lead men into litigations, and not secure inventor's real rights, therefore my friends refused to help me.

H. H. MAY.

Galesburg, Ill, Sept., 1855.

The Canadian Patent Laws.

Our readers are probably aware that under the present laws of Canada American citizens cannot obtain patents there, neither in person, by attorney, nor under any circumstances whatever. These provinces are completely sealed against us.

One of our correspondents, in writing to us recently upon this subject, says:—

"In your notice of the Patent Office report in your paper, I see our late Commissioner of Patents has wisely suggested to Congress again, the importance of allowing Canadians at least the same privileges in obtaining patents in the United States as our own citizens, which I much appreciate.

While I was at Quebec last winter, there was a bill brought up in the Provincial Parliament for the purpose of revising the Canadian patent laws, but it was so strangely opposed that it was laid over. Before Parliament broke up, however, there was a decidedly reciprocal feeling among the Members. I have just received a letter from a friend in Canada, assuring me that the bill will pass this winter with scarcely any opposition, in such a form as to give Americans the same privilege for obtaining patents in Canada that we give Canadians for obtaining patents in the United States. Their Patent Office is a meagre affair in comparison to ours. I verily believe I could pack all the models they have in their Office on a common wheel barrow. At present a single clerk and a Commissioner could do all the business. While there, I suggested to the Commissioner that perhaps I was intruding too much on his valuable time. But he said he had plenty of time, and could profitably spend an hour or two in social chat with inventors like myself.

But I presume there will be a great rush for Canadian patents as soon as the revision of their patent laws passes—which it undoubtedly will. I have written to my friends in Canada that it will be acceptable in the shape I have mentioned. We could not conscientiously ask more. P. M.

Wadham's Grove, Ill., Aug. 14, 1855."

Portable Steam Machines.

MESSRS. EDITORS—On page 394, Vol. 10, SCIENTIFIC AMERICAN, I notice the claim of S. R. Wilmot, of New York city, to the invention of a portable steam sawing machine, for the purpose, it appears from the editorial remarks accompanying the claim, of felling trees and cutting them up into logs—a machine so light and portable as to be easily carried about by one man. I have long been of the opinion that steam might be profitably employed to perform much of the hard labor of clearing land, especially where much of the timber is to be converted into cord wood, and also in pineries for cutting the trees into logs; but the desideratum hitherto has been to find a machine sufficiently light to be readily moved from place to place, and if friend Wilmot has accomplished this, and at the same time constructed a machine of sufficient strength, he has done much to diminish hard labor, and will confer a great favor upon this Western world by introducing it into these timbered regions. And why may not the same power be used to drive a thrashing machine, clover huller, straw cutter, &c., and in short, perform any of the stationary labor now performed by the horse? The expense of construction is said to be trifling, and the transportation cannot be great, and the expense of keeping must be less than the keeping of a horse. J. C. ROGERS.

Grand Rapids, Kent Co., Mich., Sept. 20, 1855.

[Our correspondent has struck a chord which must vibrate through the whole land. For performing any of the purposes named in the latter part of his letter, steam engines of every size are now manufactured in many places, and it is simply a question of economy with farmers whether they use steam or horse power.—The means are provided for supplying them with portable steam engines, and those who have large farms would no doubt find them profitable. The boiler is really the most important part of such an engine; it is the fountain of power, and the most bulky part of the machine. The smaller a cylindrical boiler is in size, it is stronger in proportion than a larger one of the same thickness of plate, but on this account, we advise the builders of such boilers to be very careful in the plate which they employ. Let perfect safety be the first consideration, in every case. All such engines should be strong, simple, and easily managed.

An Accomplished Blind Mechanic.

The *Journal de Chartres*, France, gives an account of a water mill, in the hamlet of Olsieme, near Chartres, built entirely by a blind man, without either assistance or advice from any one. The masonry, carpenter's work, roofing, stairs, paddle wheels, cogs, in a word, all the machinery pertaining to the mill, has been made, put up, and set in motion by him alone. He has also, the above Journal asserts, made his own furniture. When the water is low and the mill does not work, our blind miller becomes a joiner, and also turner, on a lathe of his own invention, and so he makes all manner of utensils, and pretty toy windmills for the juveniles. He lives quite alone, sweeps his own room, and cooks his own dinner; his mother, who has fifteen children to care for, lives a mile off, and does not trouble her head about "her blind boy," for "he earns his bread now," she says, "and does not want her." In 1852 this blind miller was rewarded with a medal by the agricultural society of the arrondissement, for a machine serving the double purpose of winnowing corn and separting the best grains from the common sort.

Decarbonizing Steel Plates.

Engraving on steel plates is an invention of comparative modern date, for which the world is indebted to the eminent American inventor, Jacob Perkins. It is impossible to engrave on the common hard steel plates, hence they have to be decarbonized or softened before the graver can act upon them—the method of doing this was discovered by Perkins. These plates are decarbonized by being placed in a vertical position in a thick cast iron box, and surrounded on all sides by a stratum of iron filings half an inch thick. The box is placed in a furnace and kept at a red heat for three or four hours, then cooled very slowly by stopping up all the air passages and covering the box with cinders to the depth of six inches. These plates are hardened again by placing them in the box with charcoal made from leather parings placed between them instead of the iron filings, and kept at a bright red heat for three hours, when they are taken out, and immediately plunged in a vertical position into cold water. All kinds of steel can be decarbonized in the same manner.

To Make Tomato Figs.

Pour boiling water over the tomatoes in order to remove the skin; then weigh them and place them in a stone jar, with as much sugar as you have tomatoes, and let them stand two days; then pour off the syrup, and boil and skim it until no scum rises. Then pour it over the tomatoes, and let them stand two days, as before, then boil and skim again. After the third time they are fit to dry, if the weather is good, if not, let them stand in the syrup until drying weather. Then place on large earthen plates or dishes, and put them in the sun to dry, which will take about a week, after which pack them down in small wooden boxes, with fine white sugar between every layer. Tomatoes prepared in this manner will keep for years

Fine Muslin Goods.

Perhaps the consumption of muslin embroidered goods affords as good a test of the wealth and luxury of a nation as the consumption and use of silk. If so, it shows a rapid rise in the wealth of the United States in the period of seven years, as one of our cotemporaries states, that during that period the importation of such fabrics have increased from $500,000 to $5,000,000 per annum. The greatest quantity of this comes from the city of Glasgow, in Scotland, whose manufacturers employ thousands of the female peasantry of Ireland in such embroidery. The work is sent from Glasgow to agents in Ireland, who distribute it among the peasantry in their own cottages.

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New Inventions.

Improvement in Cotton Presses.

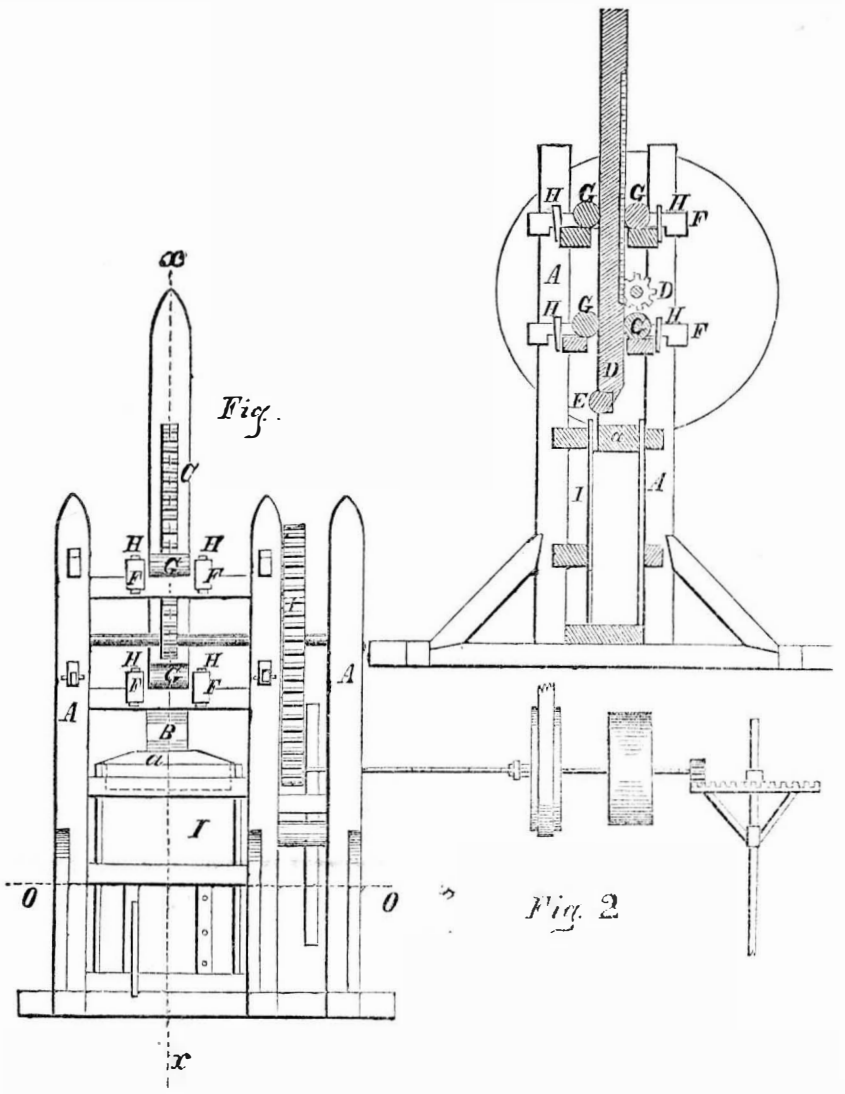
The accompanying engravings represent an improvement in Cotton Presses, for which a patent was granted to Augustus M. Glover, of Walterboro, S. C., on the 3d of July last. Fig. 1 is an elevation of the press, and fig. 2 is a transverse section, taken through the line X X, fig. 1. Like letters indicate similar parts.

The packing of cotton is essentially different from making hay into bundles, and there is an absolute dissimilarity is the construction of the press; those small variations of device and arrangement requisite in the one case are not necessary in the other. There is a tendency to consider the press that hay may be packed in as equally applicable to packing cotton, and pressing it into such form, and while pressed so, to admit of the wrapper being sewed up, the ropes tied tightly, and the bale completed while undergoing the operation. The arrangement for keeping the wrapper clear of the platten, necessary in packing cotton, is not at all required in pressing hay. By the introduction of a roller, E, upon the side of the rack rod opposite to the rack, the platten, *a*, is guided in its movement in the box, without liability of the wrapper or bagging being either ruptured or wrinkled, as the platten is prevented from touching the wrapper by said roller projecting slightly beyond the face of the platten. This improvement is more clearly understood, and the use of the roller more apparent when the platten is at its descent and the sides of the box removed after the bale is fully compressed and is below the edge of the bale box, or that portion below the line, O O, so as to allow the roping to be tied. The guide roller, G, outside of the packing box would be of little use in keeping the platten in position.

DESCRIPTION.—A A are uprights or framing with suitable cross girts. I is a box or hopper, the portion above the line, O O, being permanent, whereas that below is removable, to allow the bale to be made, and to be removed. B is a rack rod, and D a small pinion by which it is actuated. C is the rack. G G G G are guide rollers for the rack rod or piston. F F are sliding boxes or clamps for rollers G. E is a roller in the rack rod, B, at its lower end projecting slightly beyond the face of the rod, and also beyond, the platten, *a*. This platten does not occupy the whole of the space in the box, I, but leaves sufficient for the bagging or wrapper with which the box is lined, previously to introducing the loose cotton, by turning the platten partially around upon a swivel pin when above the box, the box and platten being oblong; the change in position leaves openings for introducing cotton under the platten immediately from the gin, without removing the platten or change of position in the gear. It will be noticed that as the pitch line of the cogs passes through the center of the platten a more perfect and even pressure of the bale is obtained, and as all tendency to interfere with the bagging or wrapper is avoided, by combining the roller, E, with the rack and pinion, a material improvement is thus obtained.

It will be noticed that this press is worked entirely inside of the gin house, or shed added thereto, and can be operated most effectually

GLOVER'S PATENT COTTON PRESS.



and conveniently by gearing the large wheel by a small pinion and shaft to the shaft of the gin band wheel by belting at pulley so that when the press is not in use or operation, it can be thrown out of gear in any common manner, and again brought into action without stopping the horses, or it may be worked by windlass and rope around a large wheel, if preferred.

For more information respecting this improved Cotton Press, we refer our readers to an advertisement in another column.

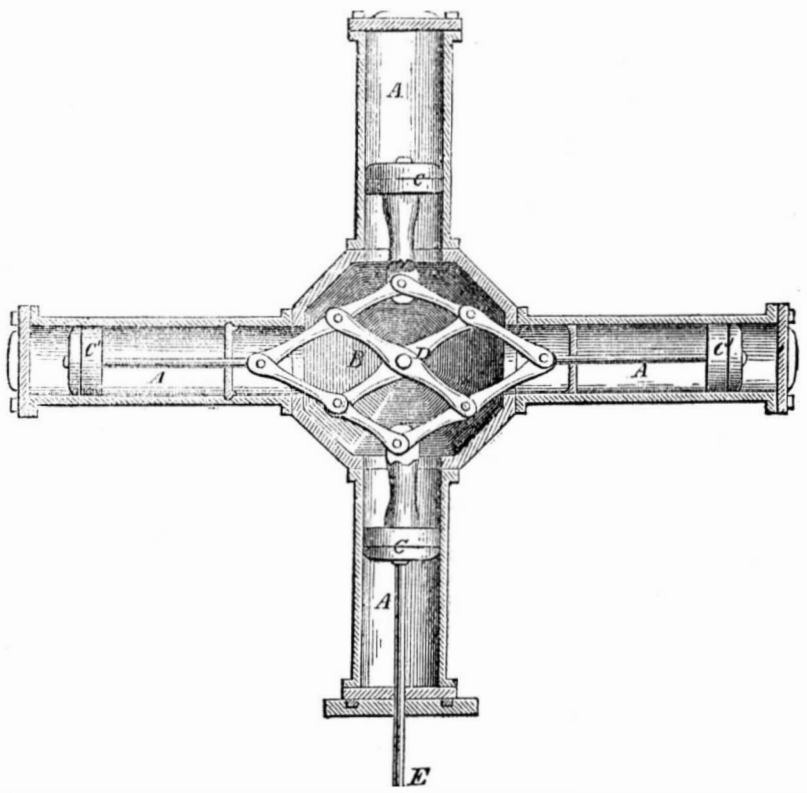
Improvement in Pumps.

The accompanying engraving is a horizontal section of a new method of constructing and operating pumps, for which a patent was granted to Thomas J. De Yampert, of Mobile, Ala., on the 11th of last month, (Sept.)

The object embraced in this patent is to get an increased effect by the combination of two or more cylinders by a system of cross levers in a central chamber. A A A A represent four cylinders united together; they may be cast in one piece, or in sections, and then bolted together. There is also a central chamber, B, which forms part of the compound pump, and answers the purpose of a cylinder. C C and C' C' are solid pistons or plungers, all connected together by rods, and a series of central angular levers connected by pins and vibrating on a central stud, D. These levers unite the pistons together and allow them to be worked by one rod, E, connected to a steam engine or any working lever.

The rods of pistons C' C', work through stuffing boxes. The inner rods of the pistons C C are thick, and act the part of partial plungers in the chamber, B, to which chamber the inner end of their cylinders are open. At the extreme ends of the cylinders there is an inlet valve communicating with a supply reservoir, and an outlet valve communicating with an air chamber through an ejection pipe. In the two cylinders, which have stuffing boxes on their inner ends, there are, also, outlet and inlet valves, so that each piston is double-acting, discharging a stream while moving in one direction, and receiving water behind it, and *vice versa*. In the bottom of chamber B, there is an inlet valve, and on its cover an outlet valve.

YAMPERT'S PATENT PUMPS.



All the outlet passages of the cylinders and the one in chamber B, communicate with the air chamber through which the water is forced in a steady constant stream and discharged by a main pipe. The two pistons, C C, which have their cylinders opening into the central chamber, B, when forced inwardly will discharge water through the outlet pipe, (not shown,) and the inlet pipe will then be closed. When these pistons are moving in a contrary direction the water will flow in through the central valve in chamber B. A partial vacuum will be formed in chamber B at the inward stroke of pistons C C, by the action of the cross levers. The cylinders may be constructed to work by single or double action; by the latter method more valves are required, and caps must be used—but this is all the difference. By one stroke of the piston rod, E, it is evident that the levers will operate the four pistons so that all the pumps will be operated by one rod, each pair of pistons having a reciprocating motion moving contrary to the traversing pistons.

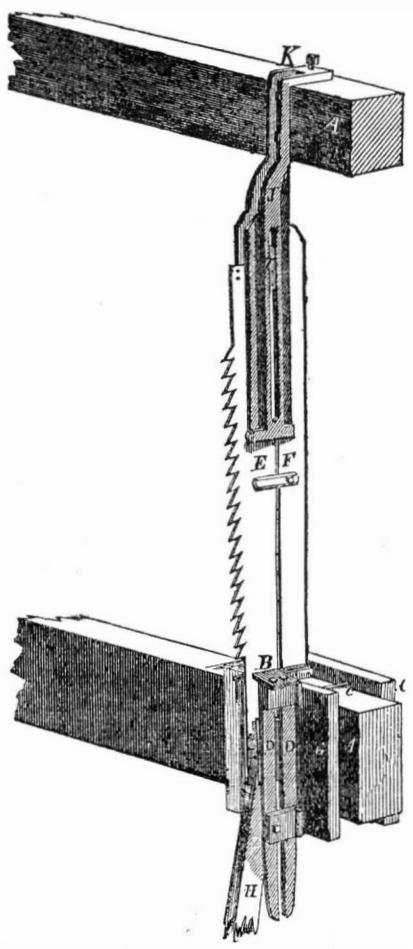
More information may be obtained by letter addressed to Mr. Yampert.

Hutchinson's Patent Mode of Hanging Saws.

This figure is a perspective view of the new mode of hanging mill saws, for which a patent was granted to Charles B. Hutchinson, of Auburn, N. Y., on the 10th of April last.

The nature of the improvement consists in the mode of holding and guiding the saws by means of a thin guide plate immediately behind and in the same plane with it, and thus following it through the log, dispensing with the fender, posts, and ways, and heavy vibrating frame. And as the plate is made thicker than the saw it also keeps it clear of the log and enables it to work steady and free.

A is the fender beam and sill of the saw mill; G are 3-inch plank. All the rest of the parts are made substantially of iron and steel. E is the saw, the same as in common use. F is the guide or protecting plate, 5 or 6 inches wide, and a trifle thicker than the saw. D D are lower guide ways secured at B. J is an upper strap and guide way, made of cast iron, in two parts, and bolted on both sides of guide plate, and of sufficient length to reach over and hook on the top of beam, A. K is a set screw for straining the plate, after it is secured to the lower end. I I are upper and lower cross heads, attached to the saw and running in the



guides. The lower one is made hollow, and may be filled with oil to feed the ways and keep them lubricated. H is the connecting rod taking hold of lower cross head and crank below. This mode of hanging saws is simple, durable, cheap, and apparently efficient, free from rack and jar. The guide plate, F, is connected at top and bottom to the beam and sill, and can be strained so tight as to dispense with the fender posts, which cannot be done with safety with the common mulley, and not at all with the gate. It can be easily applied to any mill having the gate or mulley now in use, and save power and expense in running, and do the work in a superior manner.

This improvement is on exhibition at the Fair of the American Institute in the Crystal Palace, where all those interested can see it, and judge of its merits for themselves.

Letters for more information may be addressed to Mr. Hutchinson, at Auburn.

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Scientific American.

NEW-YORK, OCTOBER 6, 1855.

The Benefits of Science and Inventions.

Governor Bigler, of Pennsylvania, delivered an address on the 14th ult. before the Philadelphia Society for Promoting Agriculture, in which he described with great force the benefits which had been conferred on different countries by science and invention. Speaking of France and England he said: "A comparison between these two countries based on the statistics of Baron Dupin will illustrate most strikingly the influence of mechanical power upon the productive capacities of nations. On the ratio of population, as exhibited by the Baron, France should be as great a commercial and manufacturing country as England; but by means of machinery the latter had increased her force equal to a population of twenty-five millions—whilst that of the former but little exceeds eleven millions."

The statistics which we have examined makes the machine power of Britain nearer four hundred millions of manual laborers than twenty-five, and no doubt we are nearer the truth than Baron Dupin. What is it which enables Britain to expend greater sums of money at the present moment than any other nation; maintain steam war fleets equal in expense to half a million of soldiers, and with them sealing every port of the vast Russian empire. Could she do this with only the manual power of her small population? No. From this, then, we learn an instructive lesson respecting the power of machinery of all kinds, for without it all nations are about equal in proportion to the number of their inhabitants. The United States is a nation second to none in power, and this we attribute to the vast amount of machine power called into requisition. Governor Bigler takes the same view of the question. On this point he said: "But it is in the United States that genius has been most diligent to save work. The smallest amount of labor for the largest pile is the maxim of the progressive American. In the World's Fair at England, and now in Paris, the Americans have stood in advance, so far as relates to the useful inventions.

"A stroll through the Patent Office at Washington city, noticing the endless variety of machinery and the countless applications for new patents, will satisfy any man, when he compares what he has seen with what can be found in other countries, of the great prominence of this American characteristic. To my mind, it is the natural consequence of our free institutions, so calculated to render active and vigorous the intellect of all classes of people."

We agree with these sentiments to the letter, but we would go a step further in the way of explanation. It is our opinion that the intense activity displayed by our inventors in devising and improving machinery is, in a great measure, due to our low patent fees, and the facilities (defective though they still are in some few respects,) for obtaining and sustaining patents. Nearly all those useful machines, reapers thrashers, locks, telegraphs, sewing machines, &c., by which America has lately astonished the people of Europe, are of but recent origin. No doubt a standard literature devoted to American inventions, in directing the attention of our people to their importance and value, has much to do with these improvements, but as this is personal we say no more about it. The fact, however, cannot be denied, that nearly all those inventions which have imparted such renown to our countrymen, both at home and abroad, and for which prizes have been awarded at the recent great Industrial Exhibitions, have all been patented, and those patents are still in force. If our patent fees were to be raised as high as those of England, we are positive that the act would be the means of retarding improvements in the useful arts, and thus be a grievous hindrance to the advancement of our country in power, comfort, and wealth. Every man, therefore, who wishes well to his country will advocate and defend every wise measure which has for its object the encouragement of inventors, and "the protection of their rights; and, in the concluding words of Governor Bigler's address, we will see "invention after invention continuing to chase each other like shadows over the plain, all tending to greater improvement, prosperity, brighter hopes, and a higher civilization in our much favored land."

A Lake of Pitch.

The last number of *Silliman's Journal* contains an account of that remarkable curiosity, "the pitch lake of Trinidad," W. I. It is situated on the western shore of the Island, near the village of La Braye, which is built on a foundation of hard pitch. The lake stands about 90 feet on a plateau above this village, is circular, and half a mile in diameter, surrounded on all sides with a dense forest. Its face is intersected with a network of water channels, which gives it the appearance of marbled paper. The surface of the pitch is pretty hard, and when the water channels are dry, it can be passed over on foot. In the center of the lake the pitch appears to be constantly and silently rising up *en masse*, and what is very singular, numerous pieces of wood are constantly coming up to the surface from below. These are from one to several feet in length, and are forced by the peculiar pressure to assume an upright position, so as to appear all over the lake like stumps of trees protruding through. It is believed that this pitch lake is boiling slowly below. Streams of sulphuretted hydrogen gas frequently issue from beneath, the temperature of which is 97 deg. Fah. The center of the lake is somewhat plastic, but around the sides the pitch is very hard. The water in the streams and small pools is pure and soft; fish are numerous in them, and alligators make them their habitation. Large springs of petroleum are in its vicinity, and about a mile northward there is a bed of brown coal cropping out upon the sea shore; it is about 20 feet thick, and appears from its dip as if it passed under the lake. The pitch is of great depth, for it has been dug into 10 feet in many places. It is believed to be a submerged bed of vegetable matter, undergoing slow distillation by volcanic action underneath. This store of bitumen appears to be inexhaustible. It is used with wood for fuel by the American steamers plying on the Orinoco river. Mixed with pebbles and sand it makes excellent pavements, and ground floors of houses. With ten per cent. of rosin oil, it makes a good pitch for ships. The Earl of Dundonald has purchased a tract of 26 acres of it, and has instituted experiments to discover, if possible, some means for making it a substitute for india rubber and gutta percha water-proof or vulcanized fabrics; and he has already made some vulcanized cloth, which, from appearances, bids fair of future success. If such a result crown his efforts—and every person must wish him success—such an inexhaustible supply of cheap material as this lake furnishes will soon bring down the price of such goods in our country, and thus confer unspeakable benefits upon our people.

Industrial Fairs.

Industrial Exhibitions have been the means of accomplishing a vast amount of good, and our people have become fully aware of their value and importance. Almost every State has its Agricultural Society and its Annual Fair, and in many States there are several County Clubs which also hold annual exhibitions. Some of these have been held already, this season, and with marked success; but the present month appears to be the favorite one with both mechanics and farmers. The Fair of the American Institute is now open in this city, as is that of the Maryland Mechanics Institute in the city of Baltimore. No less than twelve States hold their Annual Fairs this month, ranging from Canada in the North to Illinois in the West, Alabama in the South, and Connecticut in the East. These exhibitions should be countenanced and encouraged by every good citizen. They invite farmers and mechanics to exhibit their productions; they court competition; they incite to a noble rivalry in skill, industry, and science, and thus exert a most wholesome and elevating influence. By a comparison of the machines exhibited at one fair, defects are noted, while the merits of another are no less clearly pointed out. An unsuccessful exhibitor this year, in all likelihood will be successful the next, as he will go home determined to excel his neighbor next year as far as *he* was himself excelled this one. This is a noble and an honest emulation. It stirs up the genius, and leads to improvement after improvement in every department of mechanism and agriculture.

The Industrial Fairs of old Greece in her glory, enabled her to excel all nations in the arts. Those of France, Germany, and Britain, in modern times, have conferred vast benefits upon these countries. The Highland Agricultural Society of Britain—the mother of all others—has made North Britain—a naturally barren country—the most famous for agricultural skill. We state it as our candid and carefully-weighed opinion, that the nation or people which encourages and sustains such exhibitions with the greatest amount of liberality, prudence, impartiality, and perseverence, must eventually stand first in the scale for improvement in every department of industry thus encouraged. When we see so many Industrial Societies sustained and encouraged throughout the length and breadth of our wide domain, it affords us the most solid hope for the future *true* glory of our country.

The Mason Testimonial.—Last Call.

The period originally fixed for the closing of subscriptions to the Mason Testimonial was Oct. 1st, and as that day has now arrived, it becomes necessary for all who still purpose to subscribe to do so forthwith. The Treasurer it will be remembered, is S. T. Shugert, Esq., Acting Commissioner of Patents, Washington, D. C. We presume that remittances arriving there within a week or ten days of this date will be in time.

This testimonial will serve to acknowledge, in a public manner, the deep gratitude which inventors and others entertain towards the late Commissioner of Patents for his noble exertions in their behalf. It will also, we trust, have some influence in rebuking the unworthy zeal exhibited by the Secretary of the Interior in undoing good, and inflicting severe injury. It ought to remind him that the inventors of this country, while they are ever ready to appreciate as a special benefaction to themselves the labors of any man who seeks to advance and stimulate the progress of new discovery, they reserve, on the other hand, indignation and contempt for those who voluntarily become instruments to smother and retard such progress.

We hope that the credit side of the Mason Testimonial account will close with a liberal addition of funds.

Increase of the Metals.

There can be no doubt but any increase in the use of the workable metals—such as iron, copper, tin, lead, zinc, silver, gold, and platinum—tends to advance the useful arts. The cheaper these metals become, in the same proportion will man be benefitted. Were iron to be obtained at one-half its present price, the building of machinery, houses, railroads, &c., would be greatly stimulated, and all classes would be gainers by the improvement. In its own place copper is just as valuable, and were it as cheap as iron, it would be used for many purposes for which the latter is now employed. We never expect to see it become as cheap, still, we hope it will be much cheaper and plentiful than it now is. The great copper deposits of the Lake Superior regions should, in the course of time, influence the price of copper, and render it more abundant. It is estimated that the yield of pure copper from these regions this year, will not be less than 5000 tuns. In a few years these mines will be yielding more annually than is now produced by all the other mines in existence. When sheet copper becomes as cheap as tinned sheet iron, it will be exclusively employed for the roofs and conductors of buildings.

Side Screw Steamers.

The steamer *Baltic*, of Lake Erie, once a paddle wheel boat, was divested of her paddles and engines last year, and has been propelled during the present season with Capt. Whittaker's side screws—one at each side—and two short stroke high pressure engines connected by direct application to the cranks. It has been running—in connection with the New York Central Railroad and Lake Erie Railroad—between Buffalo and Sandusky cities, and with astonishing success. She now carries 300 tuns more freight, and uses only one-half the fuel that she required with her paddle wheels and old engines. Her cylinders are of three feet stroke and 26 inches bore, and her steam pressure is 45 lbs. on the square inch.

Felting Cylinders of Engines.

The cylinders of all steam engines should be well felted in order to prevent the condensation of steam by surface exposure to the atmosphere. When it is considered that steam at the atmosphere is 212° at 20 lbs., 228° at 30 lbs., 251° at 40 lbs., 269° at 50 lbs., 283° and at 64 lbs., 300° in temperature, while that of the atmosphere may be set down at 52°, we can easily perceive that the condensing of steam in unfelted cylinders—the iron of which is such a good conductor—must be far greater than most persons who employ steam engines appear to think of. The felting of steam boilers has been found to effect a great saving in fuel, and why not the felting of cylinders and valve boxes. It is our opinion that the cylinder and boiler of any engine well covered with good felting will economise one-third of the fuel, as compared with one of a like capacity having its boiler and engine exposed to the atmosphere. We notice that many of the large cylinders and steam pipes on our steamboats and in our factories do not show a patch of felt; they are left freely exposed to the air as if inviting a reduction of the steam to water before it had accomplished its work. This does not say much for the wisdom of the engineers or the proprietors.

Encroachments Upon the Patent Office.

We have further advices from Washington confirming our previous remarks, that it is the decided intention of the Secretary of the Interior to appropriate a portion of the Patent Office building, which belongs to our inventors, to the Indian Bureau.

If we cannot stay these base proceedings entirely, let every inventor [illegible] through his Representative, to influence the Honorable Secretary to be as modest as he is capable of, in the number of rooms he appropriates.—If he is not satisfied with the encroachments he has already made, let him be as lenient as possible in his further demands.

This subject will be further discussed in our next issue, and in the meantime inventors must *act*; remonstrate in every manner in which their actions are likely to influence the official who threatens the usurpation of their territory.

Atkin's Self-Raker in France.

It has been stated in some papers, giving notices of the trials of reapers in France, that the "Self-Raker" is Hussey's invention. This is a mistake, no part of the self-raker was invented or claimed by Mr. Hussey. The ingenious inventor is Mr. Atkins, of Illinois, and they are manufactured extensively in Chicago, by J. S. Wright, in connection with his improved reaper. The automatic self-raker of Atkins was highly admired for its excellent qualities and the ingenuity displayed in devising it.

The London *Artisan* states that there is a vast naval armament now in the course of construction in England, and only one paddle wheel vessel in the number—a royal yacht.

SPLENDID CASH PRIZES!

The proprietors of the SCIENTIFIC AMERICAN will pay in cash the following splendid prizes for the fourteen largest list of subscribers sent in between the present time and the 1st of January, 1856; to wit:

For the largest List	$100
For the 2d largest List	75
For the 3d largest List	65
For the 4th largest List	55
For the 5th largest List	50
For the 6th largest List	45
For the 7th largest List	40
For the 8th largest List	35
For the 9th largest List	30
For the 10th largest List	25
For the 11th largest List	20
For the 12th largest List	15
For the 13th largest List	10
For the 14th largest List	5

Names can be sent in at different times, and from different Post Offices. The cash will be paid to the order of the successful competitor immediately after the 1st of January, 1856.—Southern, Western, and Canada money taken for subscriptions. Post-pay all letters, and direct to

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☞See prospectus on the last page.

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Insects and Pestilence.—The Cholera and Yellow Fever.

Some time since there was placed in our possession the manuscript copy of an interesting treatise on the cause of cholera, by J. Franklin Reigart, Esq., of Lancaster, Pa., for which we have not had space for publication, but as he has just sent us a new fact bearing on his theory, connected with the yellow fever at Norfolk, Va., we deem it a proper time to present the substance of his observations and conclusions with other remarks.

He attributes cholera to a small poisonous fly, and considers lime water a certain antidote. Lancaster is a limestone region, and has never had over ten cases of cholera in it, although it had daily communications with Philadelphia and Baltimore (only 65 miles distant) during the time when this terrible disease prevailed in those cities in 1832 and 1852, and also in other places nearer hand. Early in the morning on July 30th, 1852, he noticed that the wooden spout of the hydrant in his yard was covered with numerous small, dead insects of a dust color, the destruction of which he attributed to the lime water deposit on the hydrant spout. This was the first time his attention was directed to this being the cause of cholera. He examined these insects with a small object glass, to satisfy himself that they were not small red ants. In cholera seasons he believes they fill the atmosphere in great swarms, but are not readily observed, owing to their dust color, and that they carry disease into every place they visit by being inhaled by persons while breathing, and also by being taken unnoticed in food and drink. Since the date mentioned, when he first entertained the idea of insects being the cause of cholera, he has gathered up many facts which have strengthened his convictions. In 1853, a year very free from cholera in the eastern cities, he was not able to obtain the account of a single one of these flies being seen. Last year about the 1st of July, when the cholera raged in New York and Philadelphia, he discovered great numbers, and he believes that for weeks the atmosphere in many places was filled with them. On the evening of Sept. 4th, 1854, during a long, dry, and warm period, he noticed at the setting of the sun that the atmosphere had a yellow brownish tint, and that the rays of light seemed moving like the aurora borealis. He was led to believe that this was caused by myriads of these insects in the air, and that they were settling down along the Susquehanna river. On the next day a south-west wind arose and blew for three days, and he concluded that if his insect theory were true, it would blow them from the river shore into the houses on the east side of the Susquehanna and develope the cholera there. This actually took place, and the cholera raged with violence in the Borough of Columbia, while Lancaster, so near to it, was healthy. Mr. Reigart believes that the pure limestone water of Lancaster is the cause of its immunity from this disease.

The following is the fact which he has sent us bearing upon his theory in relation to the yellow fever:

"The Norfolk correspondent of the Petersburg *Express*, speaking of the 'plague fly,' says:

"Its body is about the size of our common fly, of a yellowish color, with long delicate porous wings, of a texture as fine as the softest silk. They fly together in swarms, and may be seen in large numbers on the fig trees; but their great point of attraction seems to be the coffins, in which repose the ill-fated victims of 'Yellow Jack.' We took a stroll out to that Golgotha of burial grounds, Potters' Field, yesterday, and were intensely horrified at seeing many of the coffins that lay on the ground scattered around, awaiting interment, literally black with these loathsome little insects, that squirmed themselves upon one another so thick as to exclude the coffin entirely from sight. It was the most disgusting spectacle we ever beheld, having an oily, wormy significance of the last poor mortality about it that was absolutely sickening!"

In reference to these flies, Dr. Gideon B. Smith, of Baltimore, who is well known to our readers, states his belief that they were a large species of winged ants which sometimes swarm in myriads and immigrate. Large bodies of these winged ants have visited Baltimore and other places recently. Mr. Reigart, however, sent some specimens of his cholera insects last year to Dr. J. G. Morris, of Baltimore, a famous entymologist, who found them to be genuine flies, of the *genus musca*, and a species entirely new to him, and which have never been described nor published by any naturalist in the United States. The conclusion at which Mr. Reigart has arrived respecting this cholera insect is, that it came from Asia, and that the cholera can be traced in its course from that part of the world down through Russia, the Baltic Provinces, across the North Sea to the Cromarty Firth—being first seen there in the form of a yellow cloud, terrifying the inhabitants—then spreading through Britain, crossing the Atlantic to the United States, and carrying death and terror to the distant Rocky Mountains. He states that during cholera seasons the sky has always a yellowish appearance caused by clouds of insects in the air, and that they are the real scourge of man in the form of the cholera. This is an important question, as the cholera has apparently, within the past few years, become a permanent disease among us, afflicting some part of our extensive country during every month of the year. The insect theory of cholera is by no means new, but Mr. Reigart brings forth new facts to support it; still we must say that it is not conclusive.

Recent Foreign Inventions.

Graineries.—L. Salaville, of Paris, has taken out a patent for constructing grain store houses by having an air chamber under the floor of the grain room, and by having the floor on which the grain is laid pierced with small holes, through which currents of air are to be forced by a blowing machine.

Fish Blubber Soap.—R. Johnston, of Aberdeen, North Britain, has taken out a patent for manufacturing soap as follows: He first boils fish or blubber for some hours, then lets the contents in the boiler settle, and takes all but the deposit at the bottom, which is thrown out and composted to make manure. He then strains the liquor through a coarse bag, which is put into a press and all the loose matter pressed out. That which is left in the bag is put into the soap kettle with one-fourth its weight of tallow and boiled with caustic soda or potash for seven hours. The soap thus made is stated to be without smell, and of good quality.

Purifying Whale Oil.—Peter Arkell, of Stockwell, Surrey, England, has taken out a patent for purifying whale oil as follows: He puts common whale oil in an iron still with one ounce of salammoniac and a pint of turpentine to each gallon, and applies heat to the still. The still is stirred by a rod passing tight into it during the period distillation is going on. The oil that is distilled over is stated to be peculiar in its character, and of a superior quality. A quantity of black pitch is left behind in the still.

Steering Vessels.—Sir James Anderson, of Fermoy, Ireland, has obtained a patent for steering ships, by using steam pressure to act upon pistons for operating the rudder.

This is the baronet, we believe, who did so much to introduce steam carriages on common roads, but all his efforts failed of success. He is, however, a very ingenious and enterprising gentleman.

Beautiful Umbrella and Knife Handles.—B. Samuel, of Sheffield, England, has taken out a patent for manufacturing the above-named articles, having the transparency of solid tortoise shell, by first molding them of horn, then encasing them in tortoise shell by means of heat and pressure. This hint may be of great benefit to our manufacturers of knife handles.

Manufacture of Superphosphate of Lime.—C. F. Bernard, of Plymouth, England, has taken out a patent for the manufacture of dry phosphate of lime, suitable for agricultural purposes as a manure, by submitting calcined bones, or animal charcoal, to the action of sulphuric acid in a reverberatory furnace. The mass thus obtained is then dissolved in water, and that which is soluble is taken up, but the insoluble is not. It is concentrated by boiling to drive off the water, so as to produce a granular mass of high fertializing power.

Insuring the Lives of Railroad Engineers.

A correspondent in the Philadelphia *Ledger* suggests to the railroad companies the wisdom and humanity of insuring the lives of their engineers. He says: "Let railroad companies think of this suggestion. They are pained to see a faithful engineer fall at his post in the discharge of his duty, and leave a young family to the charities of a cold world. They feel that they must do something to alleviate their wants, and as in the present instance an annual appropriation is made for that purpose. But, far better would it be for railroad companies to insure the lives of all their faithful engineers, that in the event of their falling at their post, the companies may be saved the unpleasant feelings always accompanying the fact that their poor families are unprovided for. Five hundred dollars a year would insure the lives of ten engineers for $2000 each *during their entire lives*, beginning at the age of twenty-five. It is the very best means a company can employ to provide for the families of those in their employ who may, at any moment, be bereft of husband and father by such an event as the one which made a widow and orphans of the wife and children of poor Holland, who was killed recently on the Camden and Amboy Railroad, and but for whose intrepidity the accident would have been more disastrous.

"It is less than a year since the writer was an actor in a scene in a neighboring State similar to that just referred to. The poor engineer was the only victim, and his last words were, "O, what will become of my poor wife and children!" How different would have been his feelings had he known to a certainty that those he so tenderly loved would not be thrown upon charity for support. Like poor Holland he was the best engineer in the employ of the company, and like him, was compelled to close his eyes without knowing what would be the fate of the dearest objects of his earthly love.

The compensation which engineers receive precludes the possibility of their paying insurance on their own lives, or of their laying by anything for their families. Their lives are in constant peril for others' good and others' gain. They may be stricken down in a moment, and their wives and children left comparative beggars.

Men and Machines.

Let us compare a little the two modes of cutting grass. Day laborers, hired at one dollar per day, will probably mow in medium grass one and a half acres to the hand; that is, it will cost five or six dollars to mow eight acres, and twenty-five cents each hand for boarding will be one dollar and fifty cents more, which, added to five dollars and fifty cents, makes seven dollars for mowing eight acres. Now, hire a man with a span of horses and a machine to cut the eight acres at fifty cents per acre, and he will cut it in a day; four dollars, and one dollar more will pay their boarding, making in all five dollars, and the grass will be spread better for curing than a man will spread it after the five hands, which, in the estimate, will make three dollars advantage to the mower. At that rate, the machine will pay for itself in forty days' mowing, besides saving so much hard labor. But just here steps in Mr. Foggy, of the firm of Foggy, Doubt & Co., and says if the Mowing Machines do as much as eight men it will throw eight men out of work. No such thing. Mowing Machines increase the demand for labor by quadrupling the size of our farms. A few years ago a twenty acre meadow was considered "some grass." We have meadows now of a hundred acres, while in Illinois there are meadows of five hundred acres. But there is ano her proof that these machines have not lessened the demand for labor, and that is shown by the fact that during the present harvest, farm hands have received from $1 50 to $2 50 per day. Did Mr. Foggy ever know such wages to be paid to such workmen before the introduction of "these cussed machines?" We think not. Still we should like to hear from Foggy and find out for certain.

[The above is from the Albany (N. Y.,) *Knickerbocker*, and if its sentences are not finely rounded they are pithy, clear, and to the point exactly. The complaint is often made by thoughtless workmen that new machinery throws people out of employment, and thus tends to injure a portion of the community. Machinery, no doubt, supersedes hand labor, but it does not destroy the demand for laborers. On the contrary, it increases the demand for all kinds of *skilled* labor, and thus exerts a wholesome influence in raising men above mere drudgery, to become more intelligent and skillful.

No class of operatives have been so much benefitted by machinery as the very ones who have made the greatest efforts to resist its introduction. But the days of mobs to break machinery has gone past forever. All those who desire the good of themselves and their neighbors of every degree, if they are intelligent, cannot but rejoice at the success of every new machine.

A Big Gun for the Russians.

We are informed that a cannon is in process of construction in this city, which, if it realizes the design of its projectors, will make no little noise in the world, and do considerable damage to the ships and armies of the Allies. It is to be made on new principles, or rather it will be an adaptation of several old models, and will combine the peculiarities of the Paixhan gun, the Minie rifle, and the grooved musket. In addition, a new detonating powder has been discovered of two and a half to three times the explosive power of ordinary gunpowder, and the inventor claims that they will be enabled to throw their shot from twelve to fifteen miles, at an angle of not more than two inches above the level. One of our English exchanges states a gun has been invented that will throw ten miles, but then it must be elevated to a great angle to reach that distance, thereby losing much force. This new American gun, when finished, and if proved successful, is to be presented to the Czar of Russia to be used by him against the Allies. A few guns of this description, if properly aimed, would do immense damage to shipping, and would be of great use in the Baltic and the Black Sea.—[New York Herald.

[Munchausen is abroad again! We published, not long ago, an account of a ten mile gun, invented in Nantucket. This same invention appears to have been on a traveling tour ever since among the newspapers. Like a snow ball, its dimensions have been augmented by progress; it has picked up and attached to itself a curious medley of fighting materials; it has become a perfect hydra.

The wonders of this "Big Gun" are not half stated in the above description. It is a law in gunnery, that for the first few degrees of elevation in the muzzle of a cannon, the range will increase in part proportion to the angle of altitude. Thus, if the above "Big Gun" will shoot 15 miles with its mouth, elevated 2 inches, it will carry nearly 30 miles on an angle of ten inches, &c. Surely Sevastopol cannot hold out much longer!

P. S. It has been taken without the "Big Gun."

Intellect and Enjoyment.

There is no greater or more prevalent mistake than the supposition that the intellectual developement is inconsistent with a keen sense of enjoyment. There are, it is true, a considerable number of grave, dull, would-be sages, moving at a snail's pace, with a snail's gravity, through society—looking, as Oken says in his trancendental philosophy, like so many prophesying goddesses seated on tripods. But nine out of ten of them maintain a philosophic fame only on the credit of an ominous and unbroken silence; the tenth on the strength of supporting some incomprehensible paradox, which neither he nor the stupid people who listen to him comprehend. Your real philosopher is neither uncommunicative nor dogmatic; he utters his words of wisdom at the right time and place, but on ordinary occasions is like other men, and enjoys himself, perhaps even mere intensely, when enjoyment is afloat.

Dressing Circular Saws.

Contrary to the opinions expressed by two or three correspondents in our last volume, respecting the impracticability of using circular saws sharpened with sheet iron, Phillip Strickler, of Timberville Mills, Timberville, Va., states that he will not abandon the plan as long as he can cut steel with sheet iron. He trims his saw teeth in a peculiar manner, and states that there should be only 24 teeth in a four foot saw

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TO CORRESPONDENTS.

J. W., of Canada West—Your stream of water measures fifty-two cubic inches, and your fall is fifteen feet.—Are you not mistaken about the quantity of water, for, if this is all that falls every second, it is not equal to half a horse power. If you mean fifty-two inches of area, your power will be nine and a half horse, that is allowing nearly five and a half cubic feet to fall per second, according to the law of falling bodies; deduct one-third as the actual effect given out on a wheel. We would use a turbine. We can only approximate to the power of the fall, but if we knew the precise quantity of the water running, we could tell you exactly.

E. G. B., of Ohio—An apparatus such as you describe for opening and closing window blinds by means of a rack and segmental pinion has long been known. We had the same thing in use seven years ago.

A. S. S., of N. Y—You can procure a microscope such as you want of Benj. Pike, Jr., No 294 Broadway. He sells good instruments we believe,

F. R. B., of Ill.—You can purchase a good fire engine of James Smith, 39 Worth street, or Alfred Carson, 185 Mott street, New York.

W. R. D., of Ohio—We do not know the price of Mr. Francis' work. We replied to your inquiry about a work on valves. We are acquainted with no special work on the subject.

T. & B., of C. W.—As stated, your machine for sawing from the log is very simple, but you have not clearly described how you shift the log for each cut. The motion to do this must be intermittent.

J. W. H., of N. Y.—Regnault's Chemistry can be obtained of Appleton & Co., this city. It is the one we would recommend to you. If Graham's was complete, by. Blanchard & Lea, Philadelphia, we would recommend it.

S. W., of Ohio—We do not understand your question. Do you mean "does it make any difference in the rapid generation of steam in a boiler, whether it is perfectly full of water, or has a space for steam?" A boiler will generate steam faster when it has a steam space.

A. J. H., of N. Y.—There is no single book that will answer your purpose.

A. K., of Michigan—Your boiler, we conceive, is smaller than we would try to use for a cylinder of nine inch bore and twenty inch stroke. Instead of having it only six feet long, we would have one twelve feet long. Still, we have known an engine of ten inch bore and eighteen inch stroke driven by a boiler no larger than yours, with wood for fuel, but it would not answer for coal without a blower.

W. B. D., of S. C.—The specimen of mineral which you have sent us has no appearance of containing silver. Overman's Mineralogy is published by Appleton, in this city; the price, we believe, is three dollars.

A. R., of Del.—Your plan of paying out the submarine telegraph cable appears to be good.

F. C., of New York—We are not acquainted with a case of fire caused by felting surrounding steam pipes, but it is perfectly possible that such cases have occurred by steam of high pressure in the pipes, and by oil or grease in the felting.

A. S., of Montreal—You must agitate for a reformation in gas making in your city. We are not acquainted with a small apparatus suitable to your case, and that of other private consumers. The water gas is out of the question; it is a fallacy,

N. R. M., of N. Y.—You are right respecting the pressure of water on the dam, for the pressure is according to the hight or depth of water; it cannot be otherwise.

P. S., of Va.—Your plan of trimming saws is new to us so far as it relates to trimming out the root of each tooth, and this may be patentable, but the form of the top of the tooth is not new nor patentable.

D. C. W., of Mich.—Your rat trap is a novelty, and we are of the opinion that a patent can be obtained for it. It is very complicated, and on that account objectionable. If you think you can make it pay, go at it.

A. B., of Ohio—You had better defer other notices of your invention until illustrations are published. You may deem it for your interest to have it published at some future time.

J. E. L., of N. Y.—We do not know any other address for Mr. M. than Springfield, Mass. He was there the last advices we have from him. Cost of machine not known.

E. J., of Ct.—The sketch and description of your builder's telescopic level have been examined: it seems to be an ingenious apparatus, and we think a patent can be obtained for it.

S. W. H., of Vt.—The Woodstock man, to whom you refer, we do not know, and therefore cannot answer your inquiry. By reference to the lists of patents for the past three weeks, as they were published in the columns of this paper, you will find all the cases that have been issued.

W. H. C., of Mich.—Constructing a churn so as to admit of air being forced through the cream by means of a bellows, is no new thing. It has been done previous to your invention. Churn improvements are very numerous, and novelties are hard to reach in this class of subjects.

O. L., of Ill.—We are not acquainted with any machine for making baskets. Such an invention is much needed, and would undoubtedly prove of great value. The basket is an article of universal demand; but as yet its production is chiefly accomplished by hand labor.

F. G. L., of Pa.—The coloring matter of the blood is called *hæmatosine*—a &reek word. It may be obtained in the shape of a powder by evaporating blood in open air The residuum appears almost black, but when dissolved in water a red solution is produced.

M. B., of Vt.—We hope to see several amendments to he Patent Laws passed through Congress this winter. Among them, one limiting the examination into the novelty of inventions to this country. We hope that you will do your share towards the arousing of inventors to the importance of patent law reforms.

N. N., of Mass.—Your submarine armor strikes us as good. Think it could be patented. Presume the Allies would pay a handsome reward just now for such an invention, if through its use the great war vessels, now sunk in the harbor of Sevastopol, could be raised.

C. D., of S. C.—We saw several specimens of Algiers cotton on exhibition in Paris. They were excellent, and compared favorably with specimens exhibited from Georgia and South Carolina. The French government are very deeply interested in its culture, but it will be many years before a sufficient quantity can be produced to supply the home demand. Our opinion is that this result can never be reached. They must depend upon us for this important staple.

L. B. D., of Ohio—Samuel Curtis' patent was granted December, 1837, therefore it expired in 1851,

H. Y., of C. W.—Yours will meet with attention.

Money received at the SCIENTIFIC AMERICAN Office on account of Patent Office business for the week ending Saturday, Sep. 29, 1855:—

A. H., of Ky., $255; J. H., of N. Y., $25; E. G., of Vt., $25; J. S. T., of N. Y., $25; J. H., of O., $5; J. W. R., of O., $50; B. B. R., of R. I., $30; J. M., of R. I., $30; H. W. H., of N. Y., $30; L. J. A., of Ct., $32; M. P., of Vt., $30; J. P., of Ga., $23; J. N., of N. Y., $35; J. W. H., of N. Y., $25; N. H. F., of N. Y., $30; T. D., of N. Y., $30; St. J., & B., of N. Y., $60; G. E., of Wis., $30; T. & H., of O., $30; J. C., of Mo., $30; B. & B., of Ct., $25; N. C., of N. J., $30; F. & B., of Pa., $10; B. & C., of Mich., $30; C. M. S., of Mass., $30; E. L. H., of N. Y., $25; H. R. B., of N. Y., $34; D. H. D., of Me., $25; T. M. B., of O., $30; G. A. C., of Pa., $62; C. T. C., of N. Y., $25; W. A. McD., of N. Y., $25; J. A. B., of—— $55.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Sept. 29:—

Z. J. G. B., of Ill.; D. H. D., of Me.; R. G. R., of Ct.; J. W. R., (2 cases,) of Ohio; E. G., of Vt.; J. H., of N. Y.; J. S. T., of N. Y.; A. K. C., of Ct.; L. J. A., of Ct.; T. H. C., of N. Y.; W. A. McD., of N. Y.; J. H., of Ohio; J. W. H., of N. Y.; C. T. C., of N. Y.; B. & B., of Ct.; A. L. B., of N. J.; J. N., of N. Y.; E. L. H., of N. Y.; B. & C., of Mich.; A. C., of N. J.

Important Items.

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Science and Art.

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Patent Alarm Bed.

The annexed engravings represent, in a forcible manner the alarm bed of J. Carroll House, of Lowville, Lewis County, N. Y., for which a patent was granted on the 17th of last July.

Figure 1 is a perspective view showing how the bed has operated upon its occupant, who recklessly dared to sleep beyond his allotted period of rest. Fig. 2 is an outline perspective. Fig. 3 is a section of a plan view. Fig. 4 is a section of the back rails and tilting frame, showing the manner in which the hook and catch lock into each other; and fig. 5 is a section of the end rails of the tilting frame, and a view of the clock, head board, and rail. Like letters refer to similar parts.

The bedstead is made in any of the known styles, with the exception that one of the side rails is left out, but the remaining parts retain their relative positions. The posts, head board, and rail, and the like parts of the foot of the bedstead are permanently fitted together. One side rail, J, is then put in and fastened with screws. The corner braces, P, are then fastened firmly to the back, and end rails, N and L, by screws. This completes the bedst ead proper.

A round shaft, S, of iron has one of its bearings at one end in a metal plate in a post, and the other end passing through a hole in the opposite post. Collars are secured on the shaft between which is fastened a stirrup hasp to the side rail, J, by screws. This hasp admits of a rolling motion in shaft S, but not an end motion. At *a a* are fastened the hooks, fig. 4; these are fitted in place by keys. Upon the outer end of shaft S, is a square shoulder, upon which is placed the weighted lever, E, held by nut *h*. P is a lever pawl, having its fulcrum on a screw, *j*. It is so arranged that whenever the support at the opposite end is withdrawn, it will turn upon this screw, and drop, as shown in fig. 1.

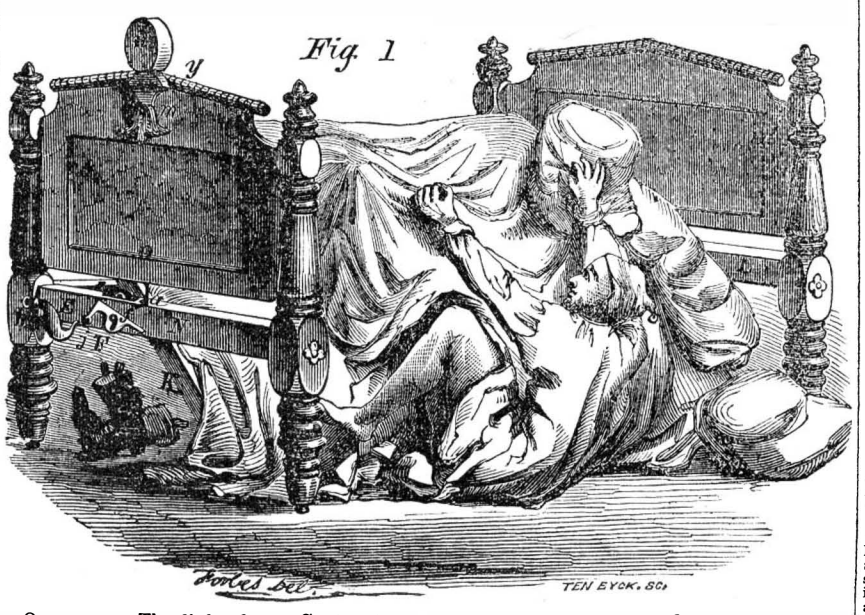
m is a bevelled strip, grooved upon its inner surface, and fastened to the back of the head board. To this is fastened the shelf, *y*, which has an aperture in it over the groove in strip *m*. O, figs. 2 and 5, represents a small iron rod passing through this aperture, and the groove, and it has its point of rotation in the metal shoe, *f*. It is kept in place by a thin plate on the top of shelf *y*, beneath which is a washer, on the rod, O. There is a small arm soldered to this rod near its lower end, and it is curved horizontally. At the upper end of rod O, is a small straight arm, *l*, fig. 5. It stands in such a relative position to the lower curved small arm at the foot of O, that when it is at right angles to the head board, the lower arm will project a short distance beyond the edge of the rail, N. M, in fig. 1, is an alarm clock of any of the usual styles of construction. It is fastened to shelf *y*, by screws. The door of the clock is removed, also the minute hand, as the latter would, in its revolution, come in contact with arm *l*, the hight of which is determined by the clock, it being necessary that it should stand over fig. 6 on the dial.

H G I K is a frame of hard wood, with side and end rails. It is of the same width as the bedstead, and in length such that it freely plays between the end rails, L N. Upon the under side of its end rails, K I, are iron bearings (one, *c*, shown.) These are placed at about two-thirds the width of the frame—from front to back—and they work in metal boxes, *d*, in the end rails of the bedstead. Upon the back strip of the frame are catches, *b*, fastened to screw bolts, W; these catches correspond in position to the hooks, *a a*, on shaft S.

This light but stout frame is corded or slatted, and fitted to receive any kind of mattrass and bed; *p* is a clothes fastener, two or three may be used to retain the clothes in place when the bed assumes an inclined position.

HOUSE'S PATENT ALARM BED.

Fig. 1



Operation—The light frame, G H I K, is placed in a horizontal position, and the buttons, *g g*, slid under its front. The bed is then made, and the clothes and sheets tucked and drawn beneath the clothes spring, *p*. The weighted lever, E, is now raised to a horizontal position, and by so doing a slight rotation of shaft S, is produced, which causes the hooks, *a a*, to take into the catches, *b b*, and bring up the pawl, F, under the lip of the lever, E, turning the upright rod, O, so that its curved arm at the foot shall slide beneath the pawl, F. This turning of rod O, will bring the upper small arm, *l*, at right angles to the face of the clock. The clock is set so that at the hour a person wishes to rise, the hour hand, *r*, fig. 5, will have arrived at 6; thus, if a person wishes to get up at 4, the clock must be set at 12, and so on. The alarm of the clock is now wound up, so as to have it ring when the hour hand, *r*, comes in contact with the small projecting arm, *l*. The hooks, *g g*, are then withdrawn, and the incumbent of the bed disposes himself to sleep under the clothes. Time with the hour hand, *r*, now moves on; at the appointed hour the alarm sounds, and if heard, by sliding in buttons, *g g*, the awakened person may arise with a grateful heart. But if he snores on, when the hour hand, *r*, comes in contact with the arm, *l*, it causes rod, O, to rotate a short distance, thus withdrawing the small arm on its foot from under pawl, F, which then drops, and by so doing the weighted lever, E, is relieved of its support, it drops, and rotates the shaft, S, unlocking the hooks, *a a*, from the catches, *b b*, and the bed frame is then tilted over, as depicted in fig. 1. It will thus be seen that this is a tilting bed, operated by an alarm clock, which can be set for any hour, to give the person reposing on it, any number of hours to sleep from 1 to 12. In many cases, such beds are no doubt of great use, so as to arouse a person at a particular hour for an important transaction.

Fig. 2

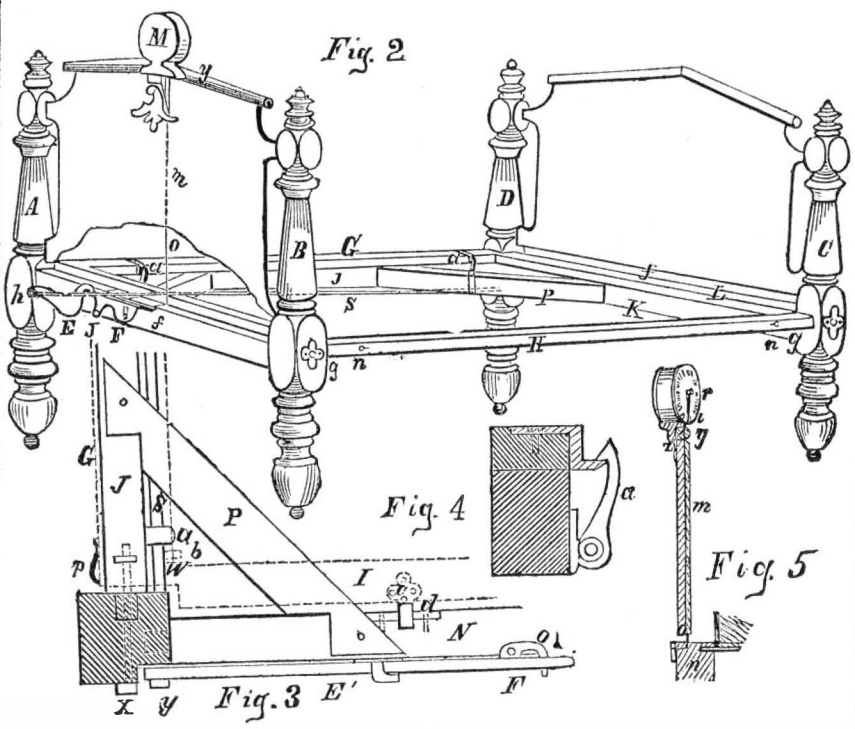


Fig. 4

Fig. 5

Fig. 3

Every person will perceive that this alarm bed well deserved a patent. It is a conservator of one of the most excellent qualities of a business man, viz.: "punctuality;" and fig. 1 is a powerful illustration of the way it argues and enforces the necessity of cultivating this virtue. Any sinner sleeping beyond a certain hour deserves to be tumbled out of the blankets in the manner so successfully accomplished by Mr. House.

This bedstead has been in use for nearly a year, and has proven to be a valuable and useful invention. It can be attached to any of the bedsteads in use, and can be put up by any cabinet maker or carpenter. It is on exhibition at the Fair of the American Institute, in the Crystal Palace; and further information may be obtained in person or by letter addressed to the patentee, at the Dey Street House, this city, until October 20th; after that at Lowville, N. Y.

Substitute for the Potato.

The "Chinese Yam" has been introduced into France, and cultivated with considerable success. It is stated that it offers to be a good substitute for the potato, and that its yield is very great.

Literary Notices.

The United States Magazine—This periodical has become one of the most beautiful, interesting, and instructive in our country. The number for this month commences the publication of the "Lay of the Last Minstrel," illustrated with numerous wood cuts. It also contains a very excellent article on public libraries, with engravings of the most distinguished of them, both in Europe and in America. A clever article on the manufacture of musical instruments is illustrated with engravings of the extensive and beautiful factory of Carhart, Needham, and Co., Twenty-third street, this city, for manufacturing melodeons. Published by J. M. Emerson, Spruce street, this city.

A Voice to America—This volume consists of a series of well written essays upon the national affairs of the United States. These contributions, it is understood, are the joint productions of different writers of ability, each having selected and discussed the subject upon which he considered himself best informed. They all tend to a common object, viz.:—the preservation of our republican liberties and free institutions. The various rocks and quicksands upon which, in times past, other nations have been wrecked, are vividly pointed out; while, at the same time, much salutary counsel relative to the individual rights and duties of American citizens is introduced. Some persons may object to this book as being unnecessarily severe in its strictures upon Popery and foreign influence; but, as a whole, its circulation can hardly be otherwise than beneficial. New York; published by Edward Walker, 114 Fulton street.

Stray Leaves from the Book of Nature—By M. Schele de Vere, of the University of Virginia. Seldom have we read a more charmingly written volume, or one that contains so much and such delightful knowledge. From title page to "finis," it is one continual series of useful facts gathered with consummate skill from nature, animate and inanimate. The earth, with all its geological, botanical, and animal wonders; the ocean, with its vast heaving bosom, and its myriad forms of life; the heavens, with their countless worlds of light and mysteries unspeakable—all are made to contribute something of striking interest. New York: G. P. Putnam & Co., publishers, 10 Park Place.

Blackwood's Magazine—This old favorite for September contains "Zaidee," a romance, continued. The leading article is "Life in the Interior of Russia," giving an account by an eye witness of great experience, of the social condition of the people in that empire. It is a most instructive and ably written paper. "Notes on Canada, and the north-west States of America," by a British traveler, are full of spice, discrimination, and very clear views of the "go ahead American pioneers" in the Western World. These Notes of themselves are worth the price of the magazine. The other articles are also good. Published by Leonard Scott, & Co., No. 54 Gold street, this city, who also publish all of the standard foreign reviews.

The Nautical Magazine—For this month, contains some capital articles. The leader is on "Stability in Vessels," and the next is a very full illustrated description of the new steamer *Arago*. Published by Griffiths & Bates, No. 115 Nassau street, New York.

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